THE
RAILWAY GAZETTE
A Journal of Management, Engineering and Operation
INCORPORATING
Railway Engineer · TRANSPORT · The Railway News
The Railway Times · Herapath's Railway Journal · RAILWAY RECORD.
RAILWAYS ILLUSTRATED · ESTABLISHED 1835 · RAILWAY OFFICIAL GAZETTE

PUBLISHED EVERY FRIDAY
AT
33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: WHITEHALL 9233 (7 lines)

Annual subscription payable in advance and postage free:
British Isles and Abroad.....£2 5s. 0d.
Single Copies .....One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 77 No. 12 FRIDAY, SEPTEMBER 18, 1942

CONTENTS

	PAGE
Editorials	265
Letters to the Editor	268
Publications Received	268
The Scrap Heap	269
Overseas Railway Affairs	270
Electric Traction Section	272
Developments in Railway Tunnelling Methods—II	274
Irish Wartime Train Services	276
L.N.E.R. 20-ton Goods Brake Van	277
Railway News Section	279
Personal	279
Transport Services and the War	281
Stock Market and Table	288

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on further paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list which will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE *possesses the necessary permit and facilities for such dispatch.*

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

REDUCTION IN SIZE OF PAGE

To economise in paper our readers will observe a slight reduction in the size of THE RAILWAY GAZETTE *in that the size of the page has been reduced from 9 in. × 12 in. to 8½ in. × 11½ in. The type area of the page remains the same, namely, 7 in. × 10 in., but the surrounding margins have been reduced. This of course detracts from the appearance of the paper, but is one of the exigencies of the war*

TO CALLERS AND TELEPHONERS

Until further notice our office hours are:
Mondays to Fridays 9.30 a.m. till 5.30 p.m.
The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Scientific Aid for the War Effort

AN important step has been taken by the Government towards speeding still further the ever-quickening *tempo* of the war effort with the appointment of three full-time scientific advisers to the Ministry of Production. The knowledge and skill of such distinguished men as Mr. W. A. Stanier, Dr. T. R. Merton, and Dr. I. M. Heilbron can be nothing but welcome, especially at this in many respects critical juncture of the war, and their services undoubtedly will be of inestimable value to the Government. It seems a pity, therefore, that any criticism should have been aroused, even though the points made by the Parliamentary & Scientific Committee of the House of Commons are confined to the scope of the appointments, and to regret that it is not greater. As far as the latter is concerned, surely those who foresee a limitation to the panel's activities have taken an unjustifiably short view? It is true that the new advisers will not supersede the scientific organisations of the service and supply departments, which (according to the official announcement) "will continue to be responsible for the examination of new inventions and technical suggestions in their own fields"; but it seems scarcely likely that the Government would expect the work of all existing departments to be taken over by three men who are, like the minister to whom they are responsible, in the first instance co-ordinators. Surely, also, the criticism that their field of activity is to be limited to the sphere of production indicates that the real point has been missed; for what is any department concerned with in the long run save production? Clearly the latter is not confined to the mere physical manufacture of a particular weapon or other article; it must include all the complex industries and services which play an essential part in its making, and these demand equally the advice and assistance of scientists.

George Sutherland

The London & North Eastern Railway has suffered a serious loss by the death of its Chief Accountant, Mr. George Sutherland. He was the son of a Highland village schoolmaster, and entered the service of the Highland Railway in 1895 at the age of sixteen. There he worked for 18 years before joining the accountants staff of the North British Railway. His subsequent career, until he became Chief Accountant of the L.N.E.R. in succession to the present Chief General Manager, Mr. C. H. Newton, is recorded in our biographical notice on p. 279. Very early in life George Sutherland was called upon to display those high qualities of character which he possessed in such abundance, founded, as in so many cases, on a deep religious faith. The possibilities of an academic career were an early forfeit to family responsibilities which would have anchored ambition in all but the bravest and finest of spirits. Unassuming in bearing, imperturbable in manner and quiet in speech, he controlled his department with the gentlest of touches on the reins. His wide experience made him an invaluable counsellor to his company and his colleagues on the R.E.C. Accountants' Committee in these days which abound with problems demanding clear thinking. His passing will be deeply mourned by all his colleagues and friends in the railway world, high and low in station alike. To his own staff his death assumes the aspect of a personal loss.

Railway Film Propaganda

Increasing use is being made of the cinema by American railways as a means of bringing before the nation the contribution that they are making towards personal comfort, industrial efficiency, and wartime achievement. One such film, called "Railroadin'," has been produced for two of the best-known builders of diesel-electric and steam power in the U.S.A., and is being seen in fortnightly instalments by 70,000 people each month, with a steadily increasing demand. This film has no immediate publicity objective; it contains no "sales talk," nor specific mention of the products of the companies that have sponsored it, nor of the railways whose operations are represented in it. It is, in fact, a simple and forthright story of what the railways are, how they developed, and what they do. The railways themselves have been responsible for showings of the film before schools, clubs, and organisations of all types, and a number of the lines are so convinced of its value that they have bought copies outright for more extensive displays in their respective territories than would be possible by way of loan. Another recent

railway film of note is "A Great Railway at Work," commissioned by the New York, New Haven & Hartford RR. to picture the varied activities that lie at the back of the smooth working of this large system. It was exhibited first to the men and their families, in similar fashion to the excellent pre-war film displays of L.M.S.R. films to its staff by the mobile L.M.S.R. cinema unit, and then to schools, clubs, and the public in general. It is altogether desirable that the railways should thus bring before the world their function as vital institutions essential to national well-being.

Overseas Railway Traffics

In the accompanying table the traffics of the British-owned Argentine railways are converted from pesos into sterling at the rate of 16⅔ pesos to the £, or £6 for each 100 pesos. This is the special rate allowed by the Argentine Government for railway remittances to this country. The same calculation is applied in the table on page 288 of this issue. For the 9th and 10th weeks of the current financial year the Buenos Ayres & Pacific shows an increase of £26,340, the Buenos Ayres Western one of £18,120, and the Central Argentine one of £15,798, but the Buenos Ayres Great Southern has a net decrease of £2,040. On the Entre Rios the traffic change is slight. The Great Western of Brazil shows an improvement of £35,300, or 2,978 contos of reis, for the first 36 weeks of 1942. A further gain of £9,599 is announced by the United Railways of the Havana, bringing the increase for 10 weeks of the financial year to £188,606.

	No. of week	Weekly traffics £	Inc. or decrease £	Aggregate traffic £	Inc. or decrease £
Buenos Ayres & Pacific	10th	86,940	+ 14,640	809,280	+ 21,120
Buenos Ayres Great Southern ...	10th	125,100	+ 6,180	1,201,200	— 3,840
Buenos Ayres Western	10th	54,720	+ 7,980	469,800	+ 21,060
Central Argentine	10th	123,660	—	1,178,892	+ 133,968
Canadian Pacific	35th	1,526,400	+ 186,800	33,002,600	+ 5,164,800

On the Canadian Pacific the gross earnings for the first seven months of 1942 amounted to £28,591,800, an increase of £4,751,800, and the net earnings of £5,043,200 showed an improvement of £420,200 on the figures for the corresponding period of 1941.

War and Irish Train Services

The remarkable vicissitudes of passenger train services in Ireland since the beginning of the war are the subject of an article on p. 276. In neutral Eire the Great Southern Railways maintained a full train service, with all restaurant, Pullman, and buffet cars, for nearly two years from the time when Northern Ireland became involved in the war, and then, with almost dramatic suddenness, in July, 1941, the virtual drying up of coal supply cut off almost every travel amenity, and in a fortnight reduced the passenger services to one daily in each direction, calling at all stations, over each main line and the majority of the branches. The Great Northern Railway of Ireland, in neutral territory at one end of its main line and in belligerent territory at the other, until quite recently kept its running speeds almost unaltered, but was forced to lengthen its main-line overall times considerably by reason of the increasing time spent on frontier formalities, which frequently add nearly, if not quite, three-quarters of an hour to a through journey. The Northern Counties Committee, exclusively in Northern Ireland, has from the beginning of the war conformed to the general principles of reduced and decelerated service worked to in Great Britain by the parent company, the L.M.S.R. One curious result of these varying train service policies has been that, for the first time since the opening of the N.C.C. Greenisland loop, and the inauguration of the radical accelerations made possible by shortened distance and new 2-6-0 locomotives, the Great Northern, with 7½ miles further to go, has regained the ascendancy in fastest and average times between Belfast and Londonderry—a route to which war conditions have brought heavy increases in passenger traffic.

The Empire State Express

The concluding months of 1941 witnessed the jubilee of one of the most famous trains in the United States, and was appropriately celebrated by the putting into service on December 7 of trains of new streamline stock of the most modern type. This train is the Empire State Express of the New York Central System, which began to run on October 26, 1891, between New York and Buffalo. The introduction was preceded by a test run on September 14, 1891, in which No. 870, a 4-4-0 locomotive, with three cars weighing 116 tons, set up what in those early days was a remarkable speed record; the 142·9 miles from New York to Albany were run in 140 min., the 147·9 miles from Albany to Syracuse in 146 min., the 70·4 miles from Syracuse to Fairport (where an emergency stop of 8 min. was necessary due to a hot box, in 67¾ min., and the 78·4 miles from Fairport to Buffalo in just under 80 min.—total 439·6 miles in 7 hr. 28 min. overall) or 433¾ min. actual running time. When regular running began, the time allowance was fixed at 8 hr. 40 min., with stops at Albany, Utica, Syracuse, and Rochester totalling 14 min., the overall 50·7 m.p.h. average setting a new standard of long distance speed in the U.S.A. at that time. The load at first was fixed at four cars of about 160 tons weight, and for use on this train Chief Mechanical Engineer Buchanan designed the renowned "999" class of 4-4-0 locomotive, the prototype of which was credited with having covered on May 11, 1893, a mile in 32 sec., at 112½ m.p.h., though like most of the earlier American speed record claims, this feat has but scanty evidence in its support. By comparison with the inaugural 4-car trains, the new sets of streamline cars each consist of 16 vehicles, including tavern lounge, dining, parlour, and observation lounge cars, with the latest reclining chair coaches, and hauled by 300-ton streamline 4-6-4 locomotives, which make the journey, with an additional stop at Schenectady, in 8 hr. An illustration of the Empire State Express is given on page 278.

Punctuality

In our issues of April 10 and May 15 we drew attention to the action of the New York Public Service Commission in compelling the New York Central System to examine the working of certain of its trains, to ensure better punctuality; it was laid down that any express which failed to secure an "on time" record on 80 per cent. of its runs over a period of three months must be decelerated sufficiently to allow the restoration of strict punctuality. The upshot of this ruling is seen by the slowing of a number of New York Central trains, more particularly in the eastbound direction (arriving at New York) by from 10 to 15 min., from June 7 last. The Commission has now turned the limelight on to the Pennsylvania Railroad, particularly on the Buffalo and Williamsport Divisions, where late arrivals of 30 to 45 min. are common, and inadequately cleaned cars are also arousing comment. Thus in the U.S.A. war conditions are not being allowed to serve as an excuse for unpunctual operating. As the *Railway Age* rightly comments in an editorial, "When the railways are being pressed to secure the maximum productive service from every car and every locomotive, delays assume new importance, for every unnecessary delay restricts capacity. This gives incentive for the development of a 'delay-consciousness' on the part of every officer and employee involved in the movement of traffic." So far from the war shutting down all enquiry into late running and delays generally, the study of those delays by division superintendents and trainmasters is considered more than ever essential with a view to their elimination.

Tyre and Axle Failures

Among the several important factors, such as type of fastening, class of surface finish given to the bore, and the design of the wheel rim, which influence tyre performance, may be included the material of the wheel centre. As a rule, this is cast steel where locomotive wheels are concerned, but the use of cast iron might modify considerably the whole question of tyre failures, most of which seem to arise from fatigue cracks beginning at the bore. The properties of cast iron include a greater damping effect than that of steel, and this is the reason for the suggestion that a high-grade cast iron might minimise tyre failures in certain instances. That such a metal might also help to eliminate axle fractures within the wheel seat is suggested by consideration of a remark made some time ago by a test engineer of the Canadian National Railways; this was that he had never known an axle fail inside the wheel seat in passenger and freight stock where cast-iron wheel centres had been used, and he believed this was because cast iron tended to keep the stresses below the fatigue limits. In contradistinction to this, one English line using carriage wheel centres of 33/40-ton rolled steel experienced axle failures just inside the wheel fit, although considering the number of axles involved the failures were not numerous.

Watering Locomotives

Concurrently with the great increase in the size and power of the modern American locomotive, and the desire to reduce to a minimum the duration of stops for replenishing coal and water supplies, there has come a more than proportionate increase in the capacity of American tenders. From tenders carried on eight wheels there has been a gradual advance to twelve-wheel tenders,

and now to tenders supported by seven or even eight axles, in order to provide adequate fuel and water space. As compared with the average 5,000 gal. capacity of most of the larger British tenders, American tenders have progressed from their previous tank capacity of 7,000 to 12,000 gal. to capacities of 20,000 to 25,000 gal., and on some lines the limitations of existing tenders have been overcome by the introduction of auxiliary tank cars. These increased capacities have been accompanied by the problem of filling the tenders at watering stations without wasting time in the process. A delivery rate of 1,500 gal. a min. from water-columns of older times is obviously far from adequate; a rate of 3,500 to 5,500 gal. a min. is now needed. Certain risks attach to water delivery at these high rates, such as the kicking of the spout out of the inlet opening to the tender tank, and it is essential that the tender tank be provided with additional openings to allow the escape of imprisoned air when the watering is in progress. To cope with the differing heights of tenders, modern American water-columns are provided with goose necks and telescopic spouts, and, in some cases, a special locking device to anchor the spout in position, though the last-mentioned is not widely favoured as anchoring and release take up too much time.

Railway Accountants Professional Societies

ACCOUNTANCY in the railway industry has to contend with many problems which are peculiar to the multifarious but specialised businesses which must come within the scope of the staff of the railway accountant's office. It is clear, of course, that the Chief Accountants of railway companies must deal with important matters far beyond those which come under the authority of accountants in ordinary commercial life, and the staff of a railway accountant's office comprises a great number of clerks who have widely different duties to perform. There is the bookkeeping section which deals with the accounting proper, but there are other sections, such as a large part of the audit side of the office, whose work could not strictly be classified as accounting in the ordinary sense of the word. It must not be overlooked that a railway company embraces a multitude of enterprises, including the running of steamboats, road transport, air transport, canals, docks, housing, catering, investments, and so forth, in addition to the railway business proper which itself covers great manufacturing and repairing activities. The scope of the railway accounting administration is, in fact, unique in its extent and variety, and no doubt it is for this reason that the higher executive posts in the accounting department are almost invariably held by those who have been trained in the railway service all their business lives.

On another page in this issue we publish a letter from a certified accountant on "The Professional Societies and the Railway Accountancy Student," in which regret is expressed that railway accountants have not an organisation of their own, having among its objects the securing of a professional status, the promotion and encouragement of the science of railway accountancy, and the provision of a system of examinations and the issue of certificates of proficiency. On the other hand, as our correspondent points out, the examinations and various degrees of membership of the Institute of Transport are open to the railway accountancy student, and, in our view, it would seem that it might be preferable, sooner than add still further to the already many bodies catering for accountancy in its various forms, if perhaps the scope of the Institute of Transport's examination was slightly broadened. On the other hand, it must be pointed out that the facilities open to the railway accountancy student are already both comprehensive and valuable. The railway companies already encourage, by various means, those who are engaged in the accounts section of their organisation. Some years ago an intensive scheme of training accountancy apprentices was evolved by one of the companies, and has proved very successful. Moreover, in general it may be said that, in peacetime at any rate, the staffs have ample opportunities of improving their knowledge of accountancy by attending classes at the different centres, and apart from the special position of the Institute of Chartered Accountants, there would seem to be a sufficiency of accountancy organisations, which are already available to members of railway staffs. Further, there is no doubt that the success of members of their staffs in public examinations is duly observed by those in authority on the railways whose duty it is to look for talent and ability, and therefore full incentive should exist for railwaymen to take advantage of the public organisations dealing with accountancy subjects. Nor must it be overlooked that apart from doubt as to any real need for the establishment of yet another society, whose membership would be limited to those in the railway service, in some respects such a body might prove to be an embarrassment to administration. A clerk who holds a diploma is not necessarily better than and more entitled to preferment than one who has not passed an examination. The real test must always remain proved ability in carrying out the duties appertaining to the post he fills.

Science and Signalling

THE application of widening scientific knowledge to the development of signalling apparatus for some time has been slowly changing a picture which seemingly had been destined to be undisturbed for a long period. It has led to methods of working and forms of equipment that represent a new technique and call for a revised attitude towards some problems. The fundamental demands of safe traffic operation remain unchanged, but improved means of fulfilling them are now available. In some respects these were imagined as distant ideals years ago, but they then seemed either beyond reach, or attainable only at prohibitive cost. Some of those concerned in the application of electricity to signalling in the early years of the rapid expansion of railed transport, perceived that it was destined to play a much larger part in this field than was immediately practicable, but they laboured under disadvantages which only the advance of physical science and the perfection of industrial processes have at length removed. Ambitious proposals found their way into many a patent specification, but their authors lacked the means of realising them in practice. Even had they been able to construct what they envisaged the maintenance of such apparatus in a reliable service condition would in those times have encountered great obstacles. In signalling as with other branches of the practical art of railway working, improvement comes not only from the thoughts and endeavours of those immediately concerned, but from the achievements in parallel branches of science and industry, the significance of which is turned to account by those possessing breadth of vision. Unfortunately, however, it is not merely a matter of science and ordinary opportunity, or more would have been done and could be done now—economic factors loom largely. With the requisite funds at his disposal, the signal engineer could do almost anything asked of him. He must perforce get the best general results with such resources as the railways are able to place in his hands, and, on the whole, they have every reason to be satisfied with the result.

The progress achieved of more recent years has been due to several causes, but two of the most important have been the advances made in certain manufacturing processes, enabling highly finished and reliable products, such as lamps, lenses, rectifiers, lightning arresters, etc., to be incorporated to advantage in general designs, and the adaptation of conceptions derived from modern research, which had become manifest in telecommunication engineering and effected a practical revolution therein. The old electrical signalling, as the old telegraphy, made use of electricity in a few relatively simple ways. The development of carrier working and coding systems, relay storage, and associated methods, has had far-reaching effects and a single pair of wires can now serve a multiplicity of purposes without loss of reliability or safety. This last has still to be the deciding factor with the signal engineer, who has to take into account considerations which press less heavily on, say, the telecommunications engineer. With the latter a fault may merely mean calling up the wrong person, or sending an indistinct message, whereas for the signal engineer it may mean some such serious results as a pair of points moving in front of or under a train, or a false proceed signal aspect appearing. His serious responsibilities fully justify him in adopting a cautious attitude and being satisfied that, whatever change is made, wrong side failures are still excluded at least as completely as hitherto. Nor is it with him a technical problem only. He has constantly to consider the traffic operating aspect of the matter. His real difficulties and anxieties do not arise from the straightforward regular movements of trains which proceed without incident. Apparatus able to deal with them may still not be worthy of his recommendation. It is when something unusual occurs that the great test is met with, under which many signalling proposals have been found wanting. This is typically in evidence with the latest developments in power point working at long distances and the attempts made to bring the controlling and indicating for a number of locations over the minimum of conductors, to accomplish which a number of proposals have been put forward and some of them used. Whatever unusual circumstances may develop, the basic requirements of interlocking must not be infringed and all possibility of points moving at the wrong time must be excluded. In the same manner the indications received by the person controlling the traffic must, in any circumstances, be such that he cannot obtain a misleading idea of the situation. In view of the complexity of the technical problems involved it is not surprising that there are differences of opinion on the best ways of meeting them and that the mention of any one of them invariably raises a lively discussion.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

The Professional Societies and the Railway Accountancy Student

32, Ivere Drive,
Barnet, Herts

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—Several thousand clerks are engaged on full-time accountancy duties in the accounting departments of the British railway companies and this letter considers the extent to which the examinations and membership of the relevant professional societies are available to them.

Railway clerks are not admitted to the examinations of the Institute of Chartered Accountants which considers as indispensable articled service with a Chartered Accountant. As one would expect, Chartered Accountants occupy in railway accounting departments quite a number of executive posts.

The Society of Incorporated Accountants & Auditors accepts nine years' approved professional service in lieu of service under articles. Such service includes experience under a principal or county treasurer, chamberlain, or accountant, subject to certain conditions as to the duties of, and positions occupied by, candidates. Service with one of the four main-line companies would not, however, enable a student to come forward for the examinations of the society.

Professional accountancy examinations not confined to articled clerks are the Association of Certified & Corporate Accountants, the British Association of Accountants & Auditors, and the Association of International Accountants. The Association of Certified & Corporate Accountants incorporates the London Association of Certified Accountants and the Corporation of Accountants. The Institution of Certified Public Accountants has recently amalgamated with the association which is statutorily and otherwise a recognised and established body. The examinations and membership are open to those engaged in railway accountancy and, in fact, members of the association are found on the staffs of the four main-line companies.

The examinations of the Institute of Costs & Works Accountants are for those who have specialised experience in costing. The final examination subjects are Factory Organisation, Equipment and Production Methods; Advanced Accounting; Law of Master and Servant; and Costing (three papers). After passing the final examination a registered student is eligible to make application for transfer to Associateship, provided he can satisfy the Council that he has had at least three years practical costing experience, and is engaged in costing at the time of making application. Although the institute's examinations are eminently suitable for those employed in railway costing a student may have the misfortune to be transferred from the costs section of the accountant's department before completing his studies and so may be debarred from applying for membership. The Society of Incorporated Cost Consultants seems designed to cater rather for the costing accountant in public practice. It would appear that the examinations and membership of the Faculty of Auditors are not available to the audit staffs of the railway companies.

The objects of the Institute of Company Accountants are, among others, to advance the interests of accountants engaged in industry, commerce, banking, and trade. It aims at keeping quite distinct the two professions of company accountant and that of public accountant and auditor. The scope of the examinations is similar to that of the examinations of the accountancy bodies already mentioned, except that special optional subjects are arranged for the benefit of those employed by co-operative societies, local authorities, public utility undertakings, building societies, etc. From a perusal of the institute's literature, however, it would not appear that candidates in the employment of a railway company are specifically provided for in this connection.

The Institute of Book-keepers caters for those who keep books in the accounting houses of businesses. One of the conditions of fellowship is the passing of the appropriate examination in book-keeping; business methods and organisation; commerce; and either commercial arithmetic or economics or mechanised book-keeping. A candidate for fellowship must have had at least five years continuous practical experience as a book-keeper immediately prior to the date of application. For those engaged exclusively on income tax work in the accountant's department the examinations and membership of the Institute of Taxation are worthy of consideration.

Railway clerical employees are eligible, after passing the relevant examinations, for membership of either the Chartered Institute of Secretaries or the Corporation of Certified Secretaries. Both of these bodies set optional papers on the "Law Relating to Transport." The main objects of the secretarial examinations are Accountancy, Mercantile Law, Secretarial Practice, English, Economics, and Company Law etc., whereas the examinations of the recognised accountancy bodies comprise Book-keeping and Accountancy, Partnership and Executorship Law & Accounts, Costing, Auditing, Taxation, Mercantile Law, Company Law, Rights & Duties of Trustees, Receivers and Liquidators, Methods & Machinery of Business, Economics, and sometimes Statistics. The examinations and various degrees of membership of the Institute of Transport are, of course, open to the railway accountancy student. At the Associateship examination the candidate interested in accountancy can take as his second subject "Transport Finance & Accounting," although this is alternative to the highly valuable subject "Advanced Statistics." It is interesting to note that the Institute of Municipal Treasurers & Accountants affords a means of qualification exclusively to accountants engaged in local government service.

Unfortunately, railway accountants have not a similar organisation having as its objects, *inter alia*, the securing of a professional status, the promotion and encouragement of the science of railway accountancy, and the provision of a system of examinations and the issue of certificates of proficiency.

Yours faithfully,

EDWARD T. ALLSOP,
Certified Accountant

[This letter is the subject of editorial comment on page 267]

Publications Received

Statistical Year Book of the League of Nations, 1940-41. London: George Allen & Unwin Limited (League of Nations Publications Department), 40, Museum Street, W.C.1. 9¾ in. × 7¼ in. 272 pp. Price, in wrapper, 10s.; cloth 12s. 6d. net. —The preface to this book, the text of which, as usual, is given both in English and in French, points out that many difficulties were encountered in its preparation, especially as certain countries have suspended, wholly or partly, the publication of their customary statistics. Nevertheless, all the tables given in the preceding issue of the Year Book have been maintained, with the exception of those dealing with transport and with the production of alcohol and benzol. Certain errors and gaps which might have been occasioned by irregularity and delays in transmission have been obviated to some extent by postponing publication for a few months. The volume presents a synopsis, as complete as circumstances permit, of international statistics relating to the most important demographic, economic, financial, and social phenomena; and there are six maps, presented in the same form as those of the previous two editions, together with notes giving both the territorial changes which occurred up to the end of 1941, and, wherever possible, the legal provisions adopted in that connection. The tables include information concerning monetary measures, public debts, and budget accounts.

Machine Tool Control Publications. The question of intelligent production planning is vital at the present time and has been made the subject of leaflet No. 4, issued by Machine Tool Control. This is a six-page publication, attractively produced, and containing illustrations which, with the text, show how machine tools can be used to the best advantage. The leaflet is issued in the interest of all machine tool and small tool users and should prove of value to everyone concerned. Another leaflet issued by the same authority has the classification No. 5 and deals with the important subject of Tungsten Carbide economy; with it a copy of Iron & Steel Control Order S. R. & O. 1942, No. 1270, has come to us. The tungsten carbide leaflet is produced on very similar lines to the one referred to above on production planning; the information it gives is practical and assembled in an interesting manner, and the illustrations assist to make clear the advice given in the leaflet.

Technical Data on Fuel. Published by the British National Committee of the World Power Conference, and obtainable from Mr. M. W. Burt, Manager & Secretary, Society of British Gas Industries, Uplands, Epsom Road, Guildford, Surrey, price 12s. 6d. net.—A third impression of the fourth edition of this book has been published, as the second impression was exhausted several months ago. Copies of the new impression, in which the Editor, Mr. H. M. Spiers, has taken the opportunity of making a few corrections, are obtainable from the address given above. A fifth edition also is in preparation, and it is hoped that this will be published in about a year's time.

The Scrap Heap

FIRST AND THIRD
OR
THE CLASSES AND THE MASSES

I hear a tale of horror, and I fear it must
be true;
I had it from a fellow in the know, who
therefore knew.
He tells how into first class seats the third
class people pour,
And first class sit on trunks and things
along the corridor.

You book a stall, but must you take pos-
session and sit tight,
Or risk its annexation by some rude
galleryite?
And so to bag a first class seat upon a
third class ticket
Is art or craft or what you will—but
certainly not cricket.

Perhaps it is the "class," not "first" or
"third" that folk despise,
And some denomination less pointed
might be wise.
You might have "big seat," "little
seat," or "narrow seat" or wide,
And thus eliminate all trace of swagger—
likewise side.

In these so democratic days you tantalise
the masses
By any recognition of the incidence of
classes;
And once you wake to life the proletarian
indignation
They will break without a tremor every
rule and regulation.

Still, with all respect to Priestley, I really
cannot see
What other system better than the present
there could be.
Abolish "third and first," you say, and
call it "green and white"?
You will not solve your problem, and
you'll merely risk a fight.

E. R.

". . . Now, if it means 'Is your journey really NECESSARY*?' then the answer's Yes, and I want a third return to Morecambe Bay—but if it means 'Is your journey* REALLY *necessary?' then I merely want a single back to Pinner."*

[Reproduced by permission of the proprietors of "Punch"

There are thirteen associations to which accountants, auditors and secretaries may belong, but, as pointed out by a correspondent in a letter to the Editor on page 268, none of these caters especially for the railway industry. The associations are:—

Institute of Chartered Accountants.
Society of Incorporated Accountants & Auditors.
Association of Certified & Corporate Accountants.
The British Association of Accountants & Auditors.
The Association of International Accountants.
The Institute of Costs & Works Accountants.
Society of Incorporated Cost Consultants.
The Faculty of Auditors.
The Institute of Company Accountants.
The Institute of Book-keepers.
The Institute of Taxation.
The Chartered Institute of Secretaries.
The Corporation of Certified Secretaries.

* * *

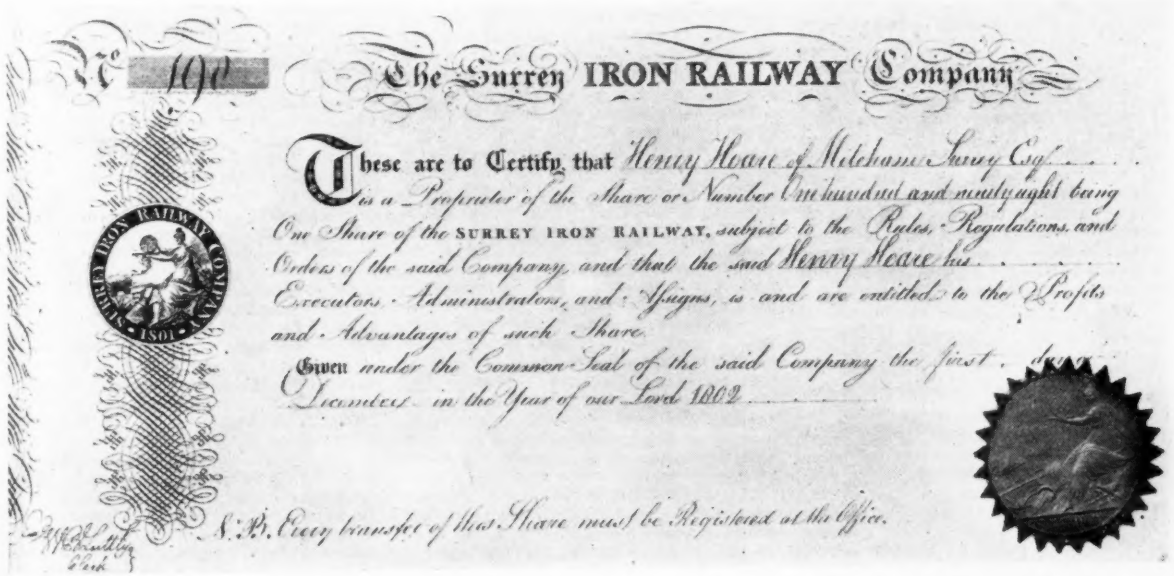
COURTESY IN TRAINS

Your correspondent signing himself "Common Decency" quotes cases where first class passengers have shown a disinclination to assist other first class passengers by "moving up" and squeezing in another passenger on each side of the carriage. One is tempted to inquire how those already seated are to recognise other first class passengers among those standing? Surely he does not suggest that those who have paid for first class accommodation should—even in war-time—voluntarily invite all and sundry to share the extra comfort which is due to and paid for by the first class passenger. How many times does one hear of the first class passenger standing for hours in long-distance trains, solaced all too occasionally by the sight of an inspector collecting excess from the third class passengers comfortably ensconced in first class seats.—*From a letter in "The Manchester Guardian."*

* * *

"END THE M.O.I."

Mr. Gordon Robbins, in his presidential address to the Institute of Journalists in London, said that after the war there must be: No more paper, metal, and man-power controls; no more censorship, and an end of the M.O.I. "lock, stock, and barrel"; no more official favouritism for the B.B.C.; and no more prosecutions, or threats of prosecutions, of newspapers unless in accordance with the ordinary process of law. He might also have added "and no more Public Relations Officers."


No 100
The Surrey IRON RAILWAY Company
These are to Certify that Henry Heare of Mitcham Surry Esq
is a Proprietor of the Share or Number One hundred and ninety eight being
One Share of the SURREY IRON RAILWAY, subject to the Rules, Regulations, and
Orders of the said Company, and that the said Henry Heare his
Executors, Administrators, and Assigns, is and are entitled to the Profits
and Advantages of such Share.
Given under the Common Seal of the said Company the first day of
December in the Year of our Lord 1802
N.B. Every transfer of this Share must be Registered at the Office.
SURREY IRON RAILWAY COMPANY
1801

The oldest known railway share certificate to have survived—reproduced from the original in the collection of Mr. Charles E. Lee. The Surrey Iron Railway Company, which was the first public railway company in the world, was formed by an Act of 41 *George III, cap* 33, *which received the Royal Assent on May* 21, 1801; *it will be noticed that the share certificate is dated December* 1, 1802

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

CANADA

Plywood Sheathing for Freight Wagons

In the assembly of 750 40 ft. 6 in. box wagons now under construction for the Canadian Pacific Railway, sheeting made from five-ply fir, ⅝ in. thick, is being used instead of 0·1-in. steel plates, thereby effecting a net saving of 2,063 lb. of steel a wagon. The plywood is held in place by steel flats, equal in thicknesses to the Z-bars which form the body-framing of the wagon, and is secured by bolts passing through all three. The joints between the steel flats and the plywood are sealed with cement, to prevent the lodgment of water and dust between the two. As compared with the wooden-sided box wagons used in the last war, the new arrangement has many advantages; it does away with the difficulty of obtaining timber in suitable lengths free from loose knots, splits, and so on, and is thus a better protection to the load against weather; and it permits the internal use of the whole width of the wagon, whereas timber sides cut off over 1½ in. of the width. The five-ply sheathing was given an exhaustive test, before it was allowed to become standard for constructional purposes.

Railway Earnings

Gross earnings of the two main Canadian railways combined in the first seven months of this year surpassed all previous records. The total rose to $345,507,000, compared with $286,659,000 in the corresponding period of last year, an increase of $58,848,000. Compared with the first seven months of 1939, when combined gross earnings totalled $176,889,000, the increase was $168,618,000. The previous record for the period was set in 1929, the only other year in which combined gross earnings exceeded the $300,000,000 (when the total was $301,588,000). For the month of July both railways reported substantial increases in gross earnings over the previous year. C.N.R. gross earnings for July were $33,133,000, the highest level for any month on record except October, 1928, which slightly exceeded this figure. Compared with the amount for July, 1941, of $25,655,000, the increase was $7,478,000. C.P.R. gross earnings for July were $21,926,000, the highest level for any month since December, 1928, when the gross earnings were $22,206,538, compared with the figure for July, 1941, of $19,359,000. Combined gross earnings of the two railways in the seven-month period were as follow:—

1928	$289,030,000
1929	$301,588,000
1930	$251,307,000
1931	$201,962,000
1932	$160,674,000
1933	$141,623,000
1934	$161,417,000
1935	$162,688,000
1936	$174,379,000
1937	$190,492,000
1938	$169,314,000
1939	$176,889,000
1940	$226,767,000
1941	$286,569,000
1942	$345,507,000

CEYLON

Goods Traffic

Due to the large number of road goods vehicles commandeered by the military authorities, more commodities are being consigned by rail, and some difficulty is being experienced in coping with demands; priority is being given to essential traffic. The flat rate in force for the transport of small consignments of goods by rail is to be increased, and the concessions allowed for the storage of large consignments are to be reduced. The present special rate for the transport of certain classes of goods to Colombo over specified sections is to be withdrawn; these goods will be charged at normal rates. The additional charge levied on parcels and baggage transported by train between South India and Ceylon is to be raised from two annas to four annas in the rupee on the South Indian Railway. Certain amendments have been made also respecting the concessions at present allowed for the transport of wagon-loads of certain commodities between stations on the South Indian Railway and Ceylon; the minimum weight for a wagon-load, to entitle the consignor to the concessionary rate, has been raised. Thus the minimum weight a wagon-load for rice, for example, has been increased to 19 tons, and for onions and potatoes to 15 tons. When these goods are conveyed in quantities below the specified minimum they will be charged at ordinary goods rates.

Railway Water Supply

Steps are to be taken gradually to provide the railway system with its own water supply. Proposals have been made from time to time for the construction of an auxiliary water system for the running sheds at Dematagoda, Colombo; a pump and pipe-line has now been installed to draw water from a nearby canal; and, at the same time, plans are being carried out for the sinking of wells at other points on the system. An independent water supply is desired not only for reasons of security, but also on account of economic considerations; at present, payment has to be made for water supplied by the Colombo Municipality and other authorities.

Opportunity for the Railway

At the annual meeting of the Ceylon Chamber of Commerce recently, the chairman (Mr. L. P. Samson) suggested that now was the time for the railway to consolidate its position, when the challenge of road transport was less acute. He said that he was sure that full advantage would be taken of the opportunity offered, for the railway was alive to the difficulties ahead, although it suffered from many handicaps.

Road Transport Industry

Mr. S. W. Nelson, Director of Transport, has formulated plans for reorganising Ceylon's road-transport industry. So far as passenger vehicles are concerned, this scheme involves the formation of limited liability companies and is designed to safeguard the interests of small bus owners, many of whom own and drive one vehicle, and who represent a large proportion of the industry. It is proposed that bus owners be combined into about 30 groups, each of which would be formed into a limited liability company, in such a way that normally only one company would operate buses over any particular route. In return for the grant of a monopoly, the companies would have to operate regular timetables, charge fixed fares, and provide, in due course, modern buses; many of the present ones are built to lorry or old car chassis. Buses would have to be maintained properly at all times, and not "window-dressed" for Government inspection once a year. Failure to operate according to the conditions laid down, or to provide adequate facilities for the public would result in the withdrawal of the licence from the company concerned. Under the new arrangements long-distance services would be discontinued, and the operators of such services would be allotted shares in two or more companies covering the route.

Goods Services

The reorganisation of road goods transport has progressed further than that of passenger transport. There are about 3,000 licensed lorries in Ceylon, and these have been formed into 83 groups, mainly on a geographical basis, to each of which a group organiser has been appointed; it is the business of the latter to know all the owners in his group, and to find out what lorries they have and what work they are doing. He then arranges where possible for a pooling of resources and for return loads, sometimes in consultation with other group organisers, so that the maximum use may be made of each vehicle and the minimum amount of petrol consumed. As a result of these arrangements also a number of lorries have been released for acquisition by the Government and military authorities, and the Director of Transport has a check on every vehicle in the island and knows the work upon which it is engaged.

UNITED STATES

The Twentieth Century Limited

On June 15 last the Twentieth Century Limited of the New York Central System, one of the most famous trains in the world, celebrated its fortieth birthday. During this period it is estimated to have earned a gross revenue of 150 million dollars, exclusive of dining car receipts, and the earnings have reached a peak of over 10 million dollars in a single year, in which over 200,000 passengers were handled. The record passenger complement was carried from Chicago to New York on January 7, 1929, when the train ran in seven sections, and conveyed a total of 822 passengers. When put on in June, 1902, the "Century" consisted of three Pullman sleepers, a dining car, and a combined mail-buffet car, and each five-coach train cost about $115,000; to-day, each 16-coach train of the new streamline stock, put into service on June 15, 1938, cost $1,384,000. Motive power has grown from the original Atlantics to the present "J3" class 4-6-4's, of which ten have been streamlined for working this service. Operation is electrical over the 33 miles between New York and Harmon, and by steam over the remaining 925 miles between Harmon and Chicago; there is one change only of the steam power, at Collinwood, East Cleveland; apart from Harmon and Collinwood, there are six other changes of engine-crews in each direction. Before the "Century" began its career in 1902, the best time over the 961 miles between New York and Chicago was 24 hr.; this was cut to 20 hr. for the new service, and the time has come down since by successive stages to 16 hr.; the present allowance for the 958-mile route, which avoids the main terminal at Cleveland, demands an overall average speed, including stops, of all but 60 m.p.h. Throughout its history the Twentieth Century Limited has been an all-Pullman train, with special service charge which has come down by degrees from $10 to $5 a trip; this is in addition to first class fare and the supplement for Pullman accommodation, which in

the present trains is exclusively in individual rooms of the roomette, compartment, double-bedroom, or drawing-room type, and this helps to explain the profitable operation of the service. Departure from New York is at 5 p.m., and from Chicago at 3 p.m.; the opposite terminals are reached in both cases at 8 a.m. The apparent difference in length of journey is explained by the change from eastern to central time or *vice versa*.

Car Loadings

The recent ruling of the Office of Defense Transportation that from May 1 less-than-carload miscellaneous freight shall not be carried in less bulk than 6 tons of freight to a wagon, rising to 8 tons from July 1 and to 10 tons from September 1, has had a marked effect on car loadings from the date of the order. During the 25 weeks ended June 20, l.c.l. freight used 2,194,811 cars, as compared with 3,885,072 in the first 25 weeks of 1941; but the sharpest decline has been in the 8 weeks from May 1, when l.c.l. freight required 777,981 cars as compared with 1,273,732 in the corresponding period of 1941—a decrease of 40 per cent. On at least 60 per cent. of the 121 major or "Class 1" systems, 20 per cent. of l.c.l. car loadings had reached the 10-ton limit, and 50 per cent. the 8-ton limit, by the end of May; cars loaded at Cleveland for Indianapolis, Cincinnati, and St. Louis were well over the 10-ton average, and cars loaded at Chicago for New Orleans were carrying up to 17 tons of l.c.l. freight. It was anticipated that by September 1 many of the larger systems would be averaging 12 to 14 tons a car, and that the amount of stock thus released to meet car shortage in other directions would be considerable. The methods adopted to obtain full loads involve specified "sailing days" at loading points for different destinations; service every second day instead of every day; and similar measures directed towards concentration of loading.

Railway Staff

By midsummer of this year the total number of employees on Class 1 railways of the United States had risen to 1,292,595—an increase of 1·73 per cent. over the previous year, and of 11·83 per cent. over the total in 1941. As compared with 1941, the increase in executives, officials, and staff assistants is 6·55 per cent., and in professional and clerical staff 13·30 per cent.; maintenance of way and works accounts for 10·91 per cent., and maintenance of equipment and stores for 11·42 per cent; transportation accounts for 14·87 per cent. in train and engine service, for 13·01 per cent. in yardmasters and engine shed staff, and for 7·55 per cent. in other grades.

Altering Access to St. Louis

Along the waterfront of the western bank of the Mississippi River, the elevated tracks of the Illinois Terminal Railroad provide access to the Union Terminal for the trains of the Alton, Chicago & East Illinois, and of the New York Central System (Big Four subsidiary), which have crossed the Mississippi by the Merchants Bridge, and also for the trains of the Chicago, Burlington & Quincy and Missouri-Kansas-Texas Railroads, which approach the city on this side of the river. The City of St. Louis now plans to improve the waterfront by laying out a park and is seeking powers from the Interstate Commerce Commission to compel the I.T.RR. to remove its viaduct and to substitute surface lines on a nearly adjacent location. There are three main railway bridges across the river—the Merchants, Eads, and Municipal bridges, as well as the McKinley bridge, which is used only by the I.T.RR. electric services; and the track alterations east of the river, in connection with the re-routing of trains which would be entailed by the removal of the elevated line, are estimated at $600,000; a further sum of from $350,000 to $500,000 would be needed to dismantle the viaduct and lay the new tracks on the west bank.

Parlour Car Seating

Hitherto, in many of the parlour and lounge cars running in the United States, a certain proportion of the space has been left unassigned, so that passengers with seats in other parts of the train may foregather, if they wish, for conversation, light refreshments, and so on. Demands on seating space are now so heavy, however, that on some routes this facility no longer can be continued. The New York, New Haven & Hartford RR., for example, eliminated, from June 28, all such "free space" in parlour cars, and these seats now are "sold" for occupancy throughout the journey in the same way as all other train seating. If the parlour-lounge car is the only such vehicle in the train, smoking is not permitted at the parlour-car end; but if there are other parlour cars in the train, smoking is permitted throughout the parlour-lounge car.

ARGENTINA

Petrol Rationing

The Argentine Government has issued a Decree for the rationing of petrol and its derivatives throughout the Republic. The Decree states that this measure is necessary to safeguard the national industries by ensuring a sufficiency of oil fuel. There was an increased consumption of petrol during the first four months of the current year of some 40,000,000 litres, as compared with the corresponding period of 1941, and it is estimated that the total consumption during 1942 will be 100,000,000 litres. The existing output of the country's oilfields is sufficient for some 50 per cent. only of national requirements, and the situation has been made worse by the fact that the foreign petroleum companies have been unable to import the normal amount due to wartime conditions. The Decree states that for this reason it is essential that the yearly consumption be reduced by at least 30 per cent.

Speed Limits

New regulations contain a clause establishing a maximum speed of approximately 55 m.p.h. for motor vehicles in general, and 50 m.p.h. for vehicles of the *colectivo* type and commercial lorries. To ensure compliance with this regulation each vehicle is required to have attached to the engine a regulating mechanism known as a "power and speed controller." This consists of a metal plate with an orifice controlling the flow of carburised petrol and adjusting this to the established power and speed. Owners of motor vehicles were allowed 30 days from the date of the Decree to have their vehicles equipped in this way. Thereafter, without a certificate to that effect, they were unable to obtain supplies of petrol.

Railway Accident

A collision in which two persons were killed and 5 injured occurred on July 18 on the Cordoba Central (State) Railway. While a goods train, to the tail of which an auxiliary locomotive was coupled, was standing in Cruz Mojada Junction, about 7 miles from Dean Funes Station, it was run into from behind by another goods train, the driver of which had overrun the signals. The guard of the first train and the fireman of the second were killed and five other members of the train staff were injured; serious damage was caused to the rolling stock of both trains.

BELGIUM

Repairs to National System

An article which appeared in our August 28 issue (page 211) described the damage suffered by the Belgian National Railways as the result of hostilities and the repairs which had been effected by the end of 1940; and some details of further damage made good are now available. By the end of 1941, 184 bridges had been repaired permanently, and 511 damaged or destroyed buildings had been reconstructed. The whole system is again open for traffic except for 47 km. (29 miles); the latter figure is due to certain bridges not yet having been repaired.

Locomotives and Rolling Stock

During 1941, 31,678 wagons were repaired; and 4,812 wagons belonging to the Nord-Belge system were added to the National Railways stock, which numbered about 98,500 by the end of the year in question. Not all of these wagons, however, were available for use in Belgium, as about 27,000 of them were in service on the Reichsbahn and other German-controlled railways. Three locomotives, 180 coaches, 6,666 wagons, and various other vehicles were still listed as "missing" by the end of 1941, and all now are presumed lost through destruction. The total war damage sustained by locomotives and rolling stock is estimated at fr. 1,376,000,000.

HOLLAND

Rolling Stock

The management of the Netherlands Railways Company announced recently, in connection with the trial run of a new 5-coach electric unit on the Amsterdam-Arnhem line, that, on completion of the orders placed in 1940 for electric stock, the amount of the latter in service will be: 25 5-coach units; 37 4-coach units; 29 3-coach units; and 47 2-coach units (in addition to older stock). It is stated, however, that a number of the 2-coach units will be converted into 3-coach units. The 5-coach unit weighs 213 *tonnes* and has a length of just over 360 ft. It has seating accommodation for 55 second class, and 268 third class, passengers; in addition, there is room for 30 and 100 standing passengers respectively. Some of the second class compartments can be converted to first class if necessary. Other features include a second class compartment at the rear of the train offering a view of the line; a large kitchen; and a dining compartment. The maximum speed is approximately 85 m.p.h.

SWEDEN

All-Welded Tank Wagon

A Swedish firm has under construction a new type of tank wagon which, by the use of welding in construction, will combine the advantages of reduced weight and increased capacity. The largest tank wagons at present in use on the Swedish State Railways weigh 13 tons and have a tank capacity of about 4,500 gal.; the new type, which is said to be approved by the State Railways, will weigh only 11 tons, but will have a capacity of 6,300 gal. The manufacturers are stated to have applied for Swedish and foreign patents for some of the constructional features

Pennsylvania Electric Locomotives' Performance

Present schedules on the electrified lines of the Pennsylvania Railroad require the 210-ton "GG-1" class locomotives to haul trains up to 1,000 tons at sustained speeds of 80 m.p.h. in ordinary service

IN the Electric Railway Traction Supplements to THE RAILWAY GAZETTE for March 29, 1940, and May 24, 1940, at pp. 32 and 54, respectively, a review was given of the electrification of the Pennsylvania main lines in the north-eastern states of the U.S.A., the most extensive in North America, covering 728 route, and 2,226 track, miles, or, including the subsidiary Long Island RR., 881 route, and 2,759 track, miles. The present article supplements the information then given with details of the existing Pennsylvania locomotive stock, and also of typical performances by the locomotives on the fast passenger services between New York, Philadelphia, Baltimore, and Washington, and New York, Philadelphia, and Harrisburg, on schedules which require the maintenance of speeds of 80 m.p.h. and more, sustained over long distances, with loads which may rise to 1,000 tons and yet be hauled by single locomotives.

The present electric fleet of the Pennsylvania Railroad, exclusive of multiple-unit suburban trains, consists of 263 locomotives —109 assigned to passenger, 126 to freight, and 28 to shunting service. Of all types in use, the greatest number built has been of the streamlined "GG-1" class, which, with various minor modifications, now numbers 100 passenger and 29 freight locomotives, all of the 2-Co-Co-2 type. Of these the 57 examples built in 1935 (Nos. 4830-4857, passenger, and Nos. 4801-4829, freight) are virtually interchangeable, as all have a rated maximum speed of 90 m.p.h., and are capable of exerting 4,620 h.p. continuously at that speed. The remaining 72 passenger "GG-1" locomotives, with their continuous rating of 4,620 h.p. at 100 m.p.h., can accelerate a train with a tare weight of 930 tons (13 all-steel Pullmans) from rest to 90 m.p.h. in a distance of 6·3 miles, and in a time of 6 min. 10 sec., on straight and level track.

The second largest number (92 locomotives of the 2-Co-2 type, allocated to freight traffic, and with a continuous rating of 3,750 h.p. at 49 m.p.h., and a maximum speed of 70 m.p.h.) is found in the "P-5a" class; one of this class (No. 5702) has been rebuilt with motors applied to the leading and trailing bogies, so increasing the starting tractive effort to 80,000 lb. and the continuous rating to 5,300 lb. at 49 m.p.h.; this is the most powerful locomotive in the service. Another fairly numerous class, of 28 locomotives, comprises the "B1" shunting type, with three axles, all motor-driven. Thus the "GG-1," "P-5a," and "B1" classes together make up 249 out of the total of 263 locomotives; the remaining 14 are various experimental types, in ones and twos. Of the total, 73 locomotives have a rated maximum speed of 100 m.p.h., 65 of 90 m.p.h., and 94 of 70 m.p.h., so that more than half the stock can be used for high-speed passenger service when required, and practically the entire stock, apart from the shunters, can move freight at speeds of up to a mile-a-minute and more. Starting tractive efforts of the majority of the passenger locomotives range from 65,500 to 78,800 lb.; the 2-Co-2 freight locomotives exert from 55,000 to 56,250 lb. on starting, and the 2-Co-Co-2 freight locomotives of the "GG-1" class 72,800 lb. In weight, the "GG-1" class locomotives range from 205 to 213 tons (of 2,240 lb.), and the 2-Co-2 class freight locomotives weigh between 175 and 176 tons; the small shunters weigh 70 tons each. Leading particulars of each type are set out in Table A.

TABLE A
Electric Locomotive Stock, Pennsylvania Railroad
11,000 volts a.c., single-phase

Year of construction	No. of locomotives	Serial numbers	Type	Starting tractive effort	Continuous rating		Maximum rated speed	Weight
					Horse-power	A speed of		
				lb.		m.p.h.	m.p.h.	tons
Passenger—								
1930	2	7850 7851	2-B-2	33,500	2,000	56	90	137
"	2	7852 7853	"	"	2,500	63	"	138
1931	2	7854 7855	"	"	2,200	46	"	135
"	2	7856 7867	"	"	2,500	63	"	134
1934	1	4999	2-D-2	57,500	5,000	100	100	179
"	1	4800	2-C-C-2	65,500	4,620	"	"	212
1935	28	4830-4857	"	72,800	"	90	90	205
1937-38	11	4858-4868	"	65,500	"	100	100	213
1938-39	20	4869-4888	"	"	"	"	"	209
1940-41	40	4889-4928	"	"	"	"	"	213
Freight—								
1924	1	3930	1-D-1	54,000	3,070	46	70	182
1931	2	4700, 4791	2-C-2	55,000	3,750	49	"	175
1932	2	5938-5939	1-D-1	"	2,500	37	54	134
1932-33	62	*4701-4742, 4755-4774	2-C-2	"	3,750	49	70	175
1933	1	5940	1-D-1	55,250	2,500	37	54	136
1934-35	28	4743-4754, 4775-4790	2-C-2	55,250	3,750	49	70	176
1935	29	4801-4829	2-C-C-2	72,800	4,620	90	90	205
1937	1	*4702	B-C-B	80,000	5,300	49	70	199
1938	1	5800	2-B-B-2	71,500	5,000	70	"	201
Shunting—								
1926	14	3900 3901, 3910 3921	C	39,500	570	16	25	70
1934-35	14	5684 5697	"	"	"	"	"	"

* Rebuilt from original 2-C-2 wheel arrangement, with motors applied to bogie trucks at each end

Passenger traffic over the electrified main line of the Pennsylvania RR. from New York is divided mainly into the following groups:—

(1) hourly express trains, leaving New York at the even hours, for Philadelphia (Broad Street), 91·4 miles;

(2) hourly express trains, leaving New York at the half-hours, for North Philadelphia, Baltimore, and Washington, 224·6 miles;

(3) through express trains between New York and Florida, *via* the Seaboard Air Line and Atlantic Coast Line routes, and between New York and the South-Western States, *via* the Southern Railway, most of which run as sections of the New York-Washington expresses;

(4) through express trains to and from Pittsburgh, Chicago, St. Louis, and the Middle West, diverging from the Washington line at Philadelphia, and electrically hauled between New York and Harrisburg, 183·6 miles;

(5) an infrequent service of express trains between New York and Atlantic City, electrically worked between New York and Trenton, 58·1 miles; and

(6) local services between New York, Trenton, Philadelphia, and Wilmington, and in the New York and Philadelphia suburban areas, worked chiefly by multiple-unit trains.

There are 58 daily departures from New York for Washington, Pittsburgh, or beyond (groups 3, 4, and 5, above), certain of which may be duplicated or triplicated at times of pressure; fourteen hourly expresses to Broad Street, Philadelphia (Group 1); four expresses for Atlantic City (Group 5); and 43 locals for Philadelphia, Trenton, South Amboy, and New Brunswick. Five daily express trains to the Lehigh Valley RR. use the Pennsylvania terminal and are worked by P. RR. electric locomotives over the short distance out to Newark. Finally, from the Sunnyside direction, in addition to the Long Island trains, there arrive a number of New York, New Haven & Hartford trains from Boston, with through sections for Philadelphia and Washington.

For its length of over 90 miles, the Pennsylvania main line between New York and Philadelphia is one of the busiest in the world. The Pennsylvania station at New York has 24 platform tracks, three of which are reserved for mail and express traffic. It is a through station, and access from the east is given by four single-track tunnels, 2½ miles long, under the East River. From the Sunnyside yards, which have 89 tracks and can accommodate approximately 1,200 passenger coaches, these tunnels are used also by the Long Island R.R. trains, and carry a service which at its maximum rises to 1,400 train movements a day. The main exit from the station to the west, however, consists of two single-line tunnels only, one 2,153 yd. long, under Manhattan and the Hudson River, and the second 2,000 yd. long, under the Bergen Hill district of New Jersey, in which the steepest grade is 1 in 53. From the Hackensack portal the line continues as double track across the Jersey Meadows to Manhattan Transfer (Harrison), 9 miles, from which point there are four tracks, increased to six over the 5½ miles between South Elizabeth and Rahway. The entire service of 81 long-distance, and 43 local, departures from New York to the west, with a corresponding number of return trains, about 250 in all each day, is worked thus over the double track section between New York and Manhattan Transfer, but as this traffic, under normal conditions, is exclusively passenger, and as there are no intermediate stops over the 10 miles

between New York and Newark, it is possible to maintain an even flow without delay, despite the fact that at busy times as many as 40 to 50 extra sections of the ordinary expresses may be run also.

All the passenger train timings of the Pennsylvania electric services west of Newark are extremely fast. The majority of the runs are booked at start-to-stop speeds of 60 m.p.h. and over; there are in all 301 daily runs, with a total mileage of 13,058, so scheduled, and 223 (10,300 miles) are at over 62 m.p.h., 83 (4,676 miles) at over 66 m.p.h., and 8 (382 miles) at over 70 m.p.h. The fastest thirty of these schedules, all at 68 m.p.h. and over from start to stop, are set out in Table B. The longest non-stop run with electric power is made by Advance No. 107, which leaves New York at 1 a.m. daily with 20 mail and express cars (no passengers), and runs non-stop over the 224·6 miles to Washington in 3 hr. 55 min., the longest regular non-stop run in the world with electric power. The Edison, an all-Pullman sleeping car train leaving New York at 12.50 a.m., runs non-stop over the 184·6 miles to Baltimore, but at a lower speed.

Some of the regular trains are extremely heavy: the combined Embassy and Tamiami Champion (5.30 p.m. from New York) loads to 18 cars, partly streamlined lightweight stock; the Legislator and the Representative to Washington (7.30 a.m. and 12.30 respectively) normally take 17; the Metropolitan (8 a.m.) and Red Arrow (5.5 p.m.) are also frequently of 17 cars, which, if exclusively of heavy-weight standard stock, can make a total of more than 1,200 tons. Of the entire westbound service between Newark and Philadelphia, 60 of the trains jointly average 73·6 min. (61·9 m.p.h.) over the 75·9 miles between Newark and North Philadelphia, all intermediate stops included. On the New York-Washington service the Congressional covers the 224·6 miles in each direction in 215 min., with five intermediate stops; there are also six trains which cover the distance in 225 min.; five in 230 min.; one in 232 min.; 11 in 235 min.; one in 238 min.; 21 in 240 min. (4 hr.); 12 in 242 to 250 min.; and 10 in 255 to 290 min.

This gives a total of 59 trains daily, at a mean average speed of 57·0 m.p.h. over the entire 224·6 miles, including in most cases at least five or six intermediate stops.

Passenger Locomotive Performance

In the design of the "GG-1" class passenger locomotives, it is clear that the Pennsylvania management has looked well ahead, and that these locomotives are more than masters of their work. For example, a typical timing of the Congressional (4 p.m. from Washington, which has the fastest schedule on the service), shows that No. 4861, with a 12-car train weighing 940 tons (of 2,240 lb.) tare, or 975 tons with passengers and luggage, completed the 224·7 miles from Washington to New York in an actual running time of 200½ min., covering 135 miles of the journey at an average speed of 80·3 m.p.h., and gaining 12½ min. on booked times. There are numerous severe service slacks in the vicinity of the large cities on the route, but intermediately the running is unrestricted and the line is practically level. The first 7·1 miles out of Washington to Landover took 9 min. 19 sec.; the next 25·8 miles to Halethorpe were run at an average speed of 85·1 m.p.h., with a maximum of 90 m.p.h.; Halethorpe, 32·9 miles, was passed in 27 min. 30 sec., and Baltimore, 40·1 miles, was reached in 37 min. 13 sec. (schedule 40 min.). After another cautious start from Baltimore, the 33·7 miles to Havre de Grace (where there is a 30 m.p.h. service slack over the bridge spanning the Susquehanna River) were covered at an average of 79·5 m.p.h.—with 16·5 miles intermediately at 85·8 m.p.h.—and the 28·4 miles from Perryville to Newport at 80 m.p.h.; Newport, 64·6 miles from Baltimore, was passed in 51 min. 56 sec., and Wilmington, 68·4 miles, was reached in 56 min. 54 sec. (schedule 60 min.), giving a start-to-stop average of 72·1 m.p.h. From Wilmington to 30th Street, Philadelphia, the 25·7 miles were completed in 24 min. 13 sec. (schedule 26 min.), inclusive of an average of 84·2 m.p.h. over the 5·1 miles from Chester to Glenolden. Despite the density of the traffic on the Philadelphia-New York stage, no signal checks were experienced, and the 76·0 miles from North Philadelphia to Newark were covered in 60 min. 56 sec., at a start-to-stop average of 74·9 m.p.h. After a rapid start, Trenton, 27·9 miles, was reached in 22 min. 30 sec., and the 42 miles to South Elizabeth were run at an average speed of 78·5 m.p.h. (including 25·4 miles at 80 m.p.h.), and another 3 min. was added to the gains on schedule already achieved.

In the reverse direction the Judiciary, with No. 4850 and a load of 670 tons tare (700 tons gross), covered the 48·1 miles from Newark to Trenton in 44 min. 41 sec.; the 27·9 miles from Trenton to North Philadelphia in 27 min. 47 sec.; the 25·5 miles from 30th Street, Philadelphia, to Wilmington in 26 min. 22 sec. (including a signal check at Holly Oak); the 68·4 miles from Wilmington to Baltimore in 58 min. 48 sec. (including a total of 50 miles at 79·9 m.p.h., a maximum of 84½ m.p.h., and including also the Havre de Grace bridge slack); and the 40·1 miles from Baltimore to Washington in 40 min. 31 sec. Total time gained on schedule by No. 4850 was 15½ min., and speed averaged 75·1 m.p.h. for 155½ miles, or 69 per cent. of the journey. Considerably faster timings were made by two "GG-1" locomotives in tandem, Nos. 4804 and 4826, in hauling the Senator, when that train was made up to 19 12-wheel Pullmans and coaches, with a total weight of about 1,300 tons. The 76 miles from Newark to North Philadelphia were covered in 62 min. 25 sec., at a start-to-stop average of 73·1 m.p.h., a gain of 10½ min. on the 73-min. schedule; from 30th Street the train cleared Chester, 12·4 miles, in 11 min. 30 sec., and reached Wilmington, 26·7 miles, in 23 min. 40 sec. (schedule 28 min.); the 68·4 miles from Wilmington to Baltimore were run in the very fast time of 53 min. 55 sec. (although allowed 62 min.), at 76·1 m.p.h. start-to-stop; and the final stage of 40·1 miles from Baltimore to Washington was completed in 39 min. 25 sec., instead of the 43 min. allowed. Excluding the exit from New York to Newark, and the short but slow run between the North and 30th Street Stations at Philadelphia, the train covered 210·2 miles in 179 min. 25 sec., including acceleration from four starts, slowing down to four stops, and various service slacks *en route*. Since the introduction of electric operation on the New York Division of the P. RR., the percentage of punctual arrivals of passenger trains, which already had reached the high level of 91 per cent. with steam operation, has further increased to 99 per cent.

TABLE B
Pennsylvania Railroad: daily runs with electric traction timed at 68 m.p.h. and over from start-to-stop

Train	From	To	Distance	Time	Speed	No. of runs daily
			miles	min.	m.p.h.	
Congressional	N. Philadelphia	Newark (N.J.)	76·0	64	71·3	1
Train No. 403	Newark (Del.)	Baltimore	56·4	48	70·5	1
Three trains (*a*)	Newark (N.J.)	N. Philadelphia	76·0	65	70·2	3
Five trains (*b*)	Baltimore	Wilmington	68·4	59	69·6	5*
Broadway Limited	N. Philadelphia	Newark (N.J.)	76·0	66	69·1	1
Sae Plane	Trenton	Elizabeth	42·6	37	69·1	1
Two trains (*c*)	Trenton	Newark (N.J.)	48·1	42	68·7	2
Fourteen trains	Baltimore	Wilmington	68·4	60	68·4	14*
Two trains (*d*)	N. Philadelphia	Newark (N.J.)	76·0	67	68·1	2

(*a*) Broadway Limited, Congressional, and St. Louisian; (*b*) Congressional (two), East Wind (two) and Constitution (one); (*c*) East Wind and No. 206; (*d*) Senator and Bay State

Freight Working

Very heavy freight movements also take place along the main line; traffic for the west, however, is diverted at Trenton, 58 miles from New York, and takes the cut-off route to Dunlap, on the Philadelphia-Harrisburg line, so avoiding Philadelphia. In the vicinity of New York, in the Jersey City area, and further west, there are a number of large yards, several of which are now in course of further extension to meet present defence demands. Waverly hump yard is for classification, carload, and l.c.l. traffic; Greenville, another hump yard, deals chiefly with through traffic to and from New England. From Greenville and Harismus Cove, cars are handled in floats across New York Harbour to Brooklyn and Manhattan. Meadows yard is chiefly a coal storage point, and Morrisville, near Newark, is an extensive area laid out for wagon classification or marshalling. In addition, enormous quantities of coal are handled at South Amboy terminal for shipment. When water traffic in New York Harbour is interfered with by thick fog, a limited number of freight trains are permitted to pass by way of the tunnels through New York to Sunnyside yard in Long Island, limited to a maximum of 30 freight cars of certain specified types in each train, and not permitted to exceed 20 m.p.h. The main-line freight workings are restricted in general to maximum speeds of 50 m.p.h.; a number of trains are scheduled to cover the 71 miles between Waverly yard and Holmes, the limit of the New York Division, in 2 hr. or less, down to a minimum of 90 min. (47·3 m.p.h. average). There is a total of 50 daily scheduled freight workings into and out of the yard mentioned above, apart from extra trains, and a total of more than 5,000 bogie freight cars has been worked through Monmouth Junction, 42½ miles from New York, in a single day. It may be added that the Pennsylvania electric locomotives in general are allotted only one hour a day for mechanical inspection; a minor overhaul, taking from 8 to 16 hr., is given once a month, and two weeks in every three years are allotted for general overhaul. The high service-availability of the electric stock explains how it is possible to work so dense a traffic over this large route-mileage with so comparatively limited a stock of motive-power units.

Developments in Tunnelling Methods—II

Shields, lining, and removal of spoil in tunnels

THE earliest known shield was patented by Max Isambard Brunel in 1818, and it differed little from the modern types, except that it was made up of a number of separate units, each of which could be moved forward independently of the others. The Greathead shield was the prototype of the present-day shield, and the essential components of the latter are the skin or tube with a sharpened front forming a cutting edge—after the manner of a horizontal well-curb—an internal stiffening structure, and a number of hydraulic jacks arranged round the rim. When used in compact ground the front of the shield may be open, but in softer ground a diaphragm plate with a door or doors giving access to the working face is used. In soft soil the face of the excavation has to be supported with poling boards and sometimes with timbering round the perimeter of the tunnel also; in modern practice this timbering is usually supported by face jacks on the front of the shield. The shield is the same whether used with compressed air or not, and it may be one of several variations of the simple type, or it may be combined with a rotary or other mechanical excavator.

In soft mud no excavation is necessary, and the mud exudes through a special opening at the top of the diaphragm with chute attached; in soft clay that material is cut off in slabs with a knife as it similarly exudes. In dry clay or harder material hand or mechanical excavation is necessary, the former aided by power knives. In sand or other similar material excavation by hand and timbering are necessary; the latter, if required for the perimeter in front of the shield, is kept wide of the tunnel and left in as the shield advances.

In open water-bearing gravel or other material, compressed air and a simple hooded shield are used. In a recent modification introduced by the late Sir Harley H. Dalrymple-Hay for such compressed-air working, the poling boards are replaced by tempered clay so as to form an air-tight annular ring in which the cutting edge becomes embedded as it moves forward. A series of pockets is scooped out and refilled with clay, beginning at the top and working downwards; the pockets project slightly beyond the circumference of the shield. Sometimes the whole face is covered with clay and straw behind the face-boards to reduce air leakage. The upper part of a hooded shield projects about 2 ft. beyond the lower cutting edge.

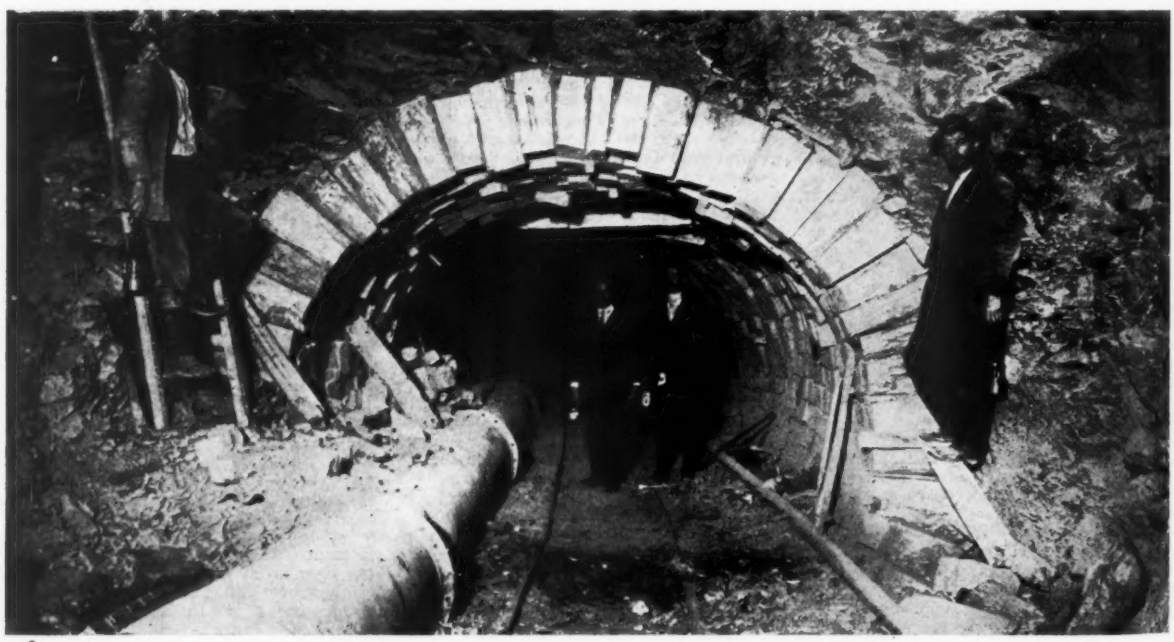
Three of the best-known types of mechanical excavators are the Price, the Carpenter, and the Anderson. The Price excavator consists of six radial arms attached to a central shaft on the shield, each carrying a knife spaced at a different distance from the centre; these, aided by a triangular toothed cutting plate at the centre, revolve about the shaft and break down the face. Each radial arm also carries a bucket which collects the spoil excavated by the knife and tips it into a chute as the arm reaches its uppermost position. In the Carpenter excavator there is a horizontal shaft carrying a boring tool and an arm at right angles to it. The arm itself forms the support for the cutting tool, which moves automatically to and fro along it as the shaft revolves. The Anderson excavator consists essentially of a revolving knife which makes a light cut over the whole face at each revolution; it has an automatic forward feed.

Lining

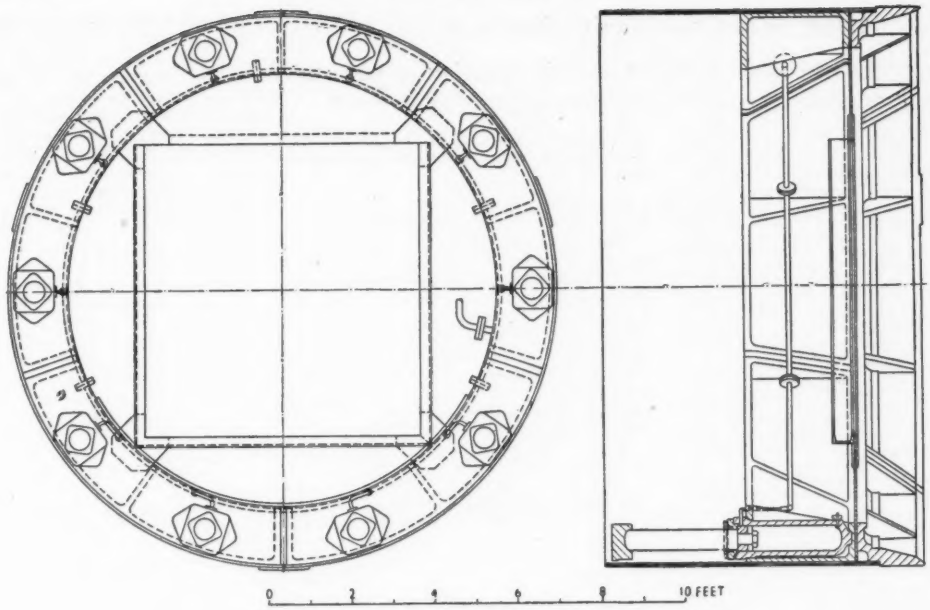
The cast-iron segmental lining is made water-tight by lead jointing or lead-wire caulking, and lead washers or red lead and oil-soaked hemp grummets for the bolts. For all large-diameter tunnels one or more hydraulic erectors coupled to the shields are used in modern practice. These erectors consist essentially of an arm at the back of the shield rotating about the centre. Each segment is supported by the arm, which is turned to the required position. Hydraulic erectors are also used separately from the shield in American practice. Of other linings, concrete is generally replacing brickwork and masonry, and, to avoid delay in shield progress while concrete is setting, pre-cast concrete keyed blocks are sometimes used. With these blocks, and in cast-iron-lined road tunnels, monolithic internal concrete linings are usually added.

(4) UNDER-WATER TUNNELS

The standard practice in under-water tunnels is to use a shield and compressed air, with, if necessary, a blanket of clay deposited on the bed of the river or channel to help



Bottom heading of the Apennine tunnel where the special Italian method of wedge-shaped wooden blocks was used to form the heading arching in place of ordinary timbering



Simple shield for 12 ft. 3 in. diameter tunnel

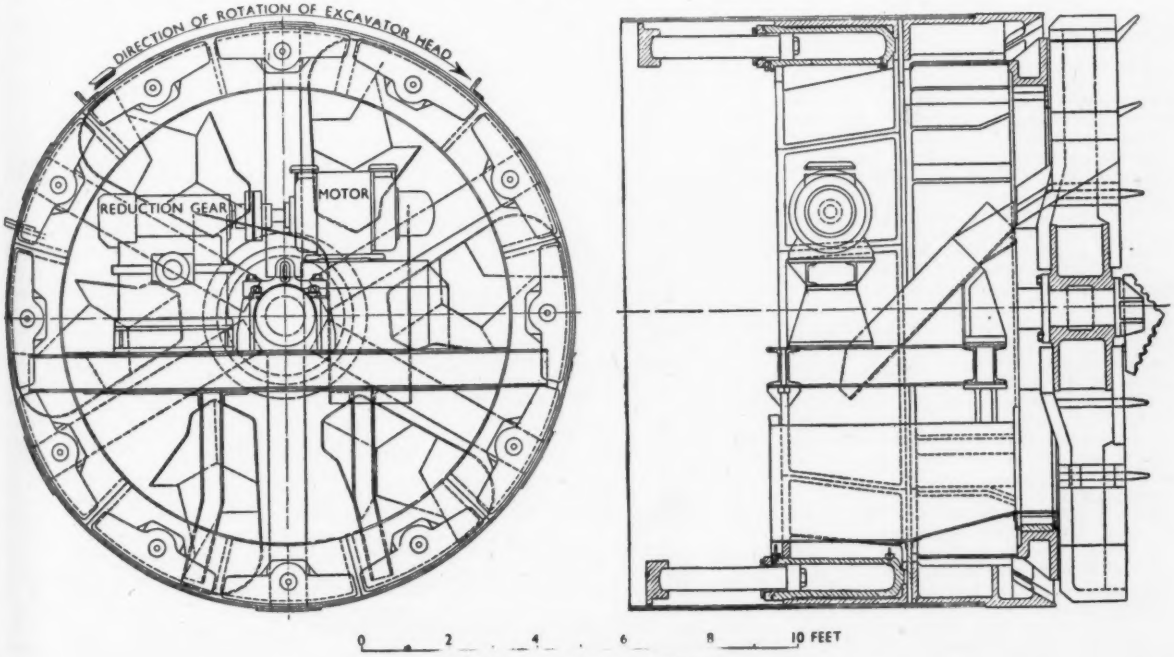
in the sealing of permeable bed material. Clay plugging of the tunnel face is also useful to secure greater air-tightness.

[Recent practice in America, however, favours the erection of complete under-water sections of cast-iron tunnels in docks or on shore, floating them to site after sealing them up, and sinking them into dredged trenches in the positions required, in cases where conditions favour such methods.—ED. *R.G.*]

Removal of Spoil

The loading and haulage of tunnel spoil is important, and often governs the rate of progress of the whole work. Mechanical loaders are of various types such as shovel, scraper, or rotating-arm bucket loaders of the Eimco-Finlay pattern; compressed-air power is generally used. Haulage is most commonly in the form of trucks drawn by compressed air, electric storage battery, or diesel locomotives, though endless cables are also sometimes used.

In the case of large tunnels it is occasionally advisable to drive a small pilot tunnel before deciding upon the details of the main tunnel. The pilot may be used either as a heading for the main tunnel or be driven parallel to it and subsequently used for drainage and ventilation. Twin tunnels are preferable to large-section under-water road tunnels, as much of that section is wasted, and, alternatively, greater tunnel cover or easier gradients are obtainable due to the smaller diameter of the twin tunnels; for double-line railways the risk of blockage of both lines is obviated by twin tunnels. Compressed-air working is also easier in tunnels of smaller section, for reasons already explained.



Rotary shield for 12 ft. 3 in. diameter tunnel

Irish Wartime Train Services

The effects of the war in curtailment and deceleration of passenger trains have been very varied in different parts of Ireland

AT various stages of the present war, statistical surveys have been given in THE RAILWAY GAZETTE of the main-line passenger train services of the four British railways, showing how they have been affected in speed and frequency in comparison with those operating immediately before the war, and also with those maintained in the concluding stages of the 1914–1919 war. The present article gives corresponding details relative to the railways of Ireland, which appear now to have settled down to the minimum compatible with maintaining the economic life of that island. During the course of this war, there have been striking differences between the passenger service developments in Northern Ireland and Eire respectively. In Eire the train services were continued in full, including all restaurant, Pullman, and buffet cars, for nearly two years after the declaration of war, in which, of course, Eire has been a neutral; then, in July, 1941, with great suddenness, an acute coal shortage made itself felt, with the result that in two stages, spread over only a fortnight —from July 14 to 28—the train services of the Great Southern Railways were cut down from their full peacetime strength to a single passenger train daily over each main line and branch, calling at all stations. So things have remained, with the slight amelioration that over the two principal main lines of the G.S.R. the Cork and Galway trains now run non-stop between Dublin and Ballybrophy, 66 miles, and Dublin and Mullingar, 53 miles, respectively; the Waterford and Limerick portions in the former case, and the Sligo portion in the latter, run as separate trains and serve the intermediate stations. Certain of the shorter branches have two services each way daily, and a fairly ample suburban service has been restored to the Dublin (Westland Row) and Bray line.

N.C.C. Decelerations

By comparison, the Northern Counties Committee, in common with the British railways, reduced its speeds from the outbreak of war, and since then has further slowed down its trains, chiefly as a result of withdrawing local services along its Dublin-Londonderry main line, and doing their station-to-station work with the long-distance trains. As a result, for the first time since the opening of the N.C.C. Greenisland loop, and the considerable curtailment in time that followed (partly as a result of cutting out the reversal of trains at Greenisland, and partly from the accelerations in running made possible with the new 2-6-0 locomotives), the Great Northern Railway of Ireland, by a small margin, has again the fastest service between Belfast and Londonderry, though over a route 7½ miles longer than that of the N.C.C. Such has been the increase of traffic between these two Northern Ireland cities, indeed, that the G.N.R. service is 25 per cent. more ample than in peacetime, and the average journey time is increased only from 3 hr. 6 min. to 3 hr. 14 min.; the fastest time is 2¾ hr. instead of 2 hr. 35 min. The fastest N.C.C. time, on the other hand, has grown from 2 hr. 10 min. to 2 hr. 50 min., and the average time from 2 hr. 28 min. to 3¼ hr. On the Belfast-Dublin main line of the G.N.R. there has been a considerable slowing of trains, chiefly due to the time occupied in frontier formalities. Scheduled time so taken up (and frequently exceeded) at Dundalk and Goraghwood now totals 40 to 43 min. going north, and 33 to 36 min. coming south.

Frontier Handicap

The increasing frontier handicap explains why, despite the advent of much more powerful locomotives, the best time between Dublin and Belfast was only 5 min. faster in 1939 than in 1918 (when there was no frontier), whereas in 1942 it has been increased to 3¼ hr., and average time in proportion. During the present year, also, the express service between the two capitals has been reduced from 5 to 3 trains in each direction daily.

In the annexed table the Irish passenger services in 1918, 1939, and 1942 are summarised in the usual statistical form, showing the fastest times, the number of trains operating daily over each route (the sum of up and down day trains in each case), and the average journey times. The present G.S.R. services average in frequency one-third of those in 1918, and one-third to one-quarter those in 1939, and their average speed is only from 21 to 27 m.p.h. overall. On the G.N.R. the frequency on the Dublin-Belfast main line is now three-quarters of that in 1918, and three-fifths of that in 1939, but although the best times have been greatly increased, the average journey is only 38 min. longer than in 1939, and 25 min. than in 1918, despite the frontier complication. On the Derry line, on the other hand, the frequency is 66 per cent. greater than in 1918, and 25 per cent. greater than in 1939, and the average journey takes 19 min. less than in the former year and only 8 min. more than in the latter. On the N.C.C. the cuts in time were so great after the opening of the Greenisland loop —the best Belfast-Portrush time came down ultimately from 2 hr. 35 min. in 1918 to 1 hr. 13 min. in 1939, and between Belfast and Londonderry from 3 hr. 20 min. to 2 hr. 10 min.—that even now the average journey, though much longer than in 1939, is shorter than in 1918, by 38 min. in the case of Portrush and 21 min. in that of Derry. On the Belfast & County Down Railway there has been but little change. There are now four more trains operating between Belfast and Newcastle than in 1918, and even one more than before the outbreak of the present war; from 1939 the average journey has increased only by 11 min., from 80 min. to 91 min. A line which has seen a considerable increase in its operating responsibilities, in present war conditions, is the Londonderry & Lough Swilly, between Londonderry and Buncrana, in the summer of 1939, the train service had come down to one train each way on Saturdays only, and two on Sundays; now there are six trains each way daily, and eight on Saturdays. The 75-mile Burtonport extension, which was in use in 1939, is now served, however, by buses, of which the L. & L.S. has an extensive network, between Derry, Moville, and Shrove; Derry, Carndonagh, and Malin Head; Derry and Letterkenny; Moville and Carndonagh; and elsewhere.

FASTEST AND AVERAGE TIMES AND FREQUENCY OF SERVICE OF DAY TRAINS OVER PRINCIPAL IRISH MAIN LINES IN 1918, 1939 (BEFORE WAR), AND 1942

—	Distance	Fastest times			No. of trains daily			Average times		
		Oct., 1918	Aug., 1939	Aug., 1942	Oct., 1918	Aug., 1939	Aug., 1942	Oct., 1918	Aug., 1939	Aug., 1942
	Miles	h. m.	h. m.	h. m.				h. m.	h. m.	h. m.
G.S.R. (from and to Dublin)										
Maryborough	50·9	1 08	0 58	2 02	8	9	2	1 44	1 20	2 12
Athlone	80·3	*2 13	2 16	2 58	6	6	2	*2 25	2 26	2 59
Wexford	92·8	3 48	3 15	3 50	4	6	2	3 57	3 31	4 02
Waterford	110·3	4 07	3 10	5 00	6	8	2	4 38	3 43	5 08
Galway	128·6	*3 58	3 50	5 05	6	6	2	*4 21	4 04	5 05
Limerick	‡128·9	4 00	3 00	5 00	6	8	2	4 31	3 19	5 08
Sligo	136·4	*4 35	4 20	5 30	6	6	2	*4 56	4 32	5 43
Cork	165·3	4 00	3 33	6 15	6	6	2	5 51	4 00	6 25
G.N.R. (from and to Dublin)										
Dundalk	54·3	1 08	1 00	1 09	8	10	6	1 18	1 05	1 11
Belfast	112·6	2 30	2 25	3 15	8	10	6	2 54	2 41	3 19
G.N.R. (from and to Belfast)										
Warrenpoint	50·7	1 30	1 20	1 30	10	14	12	1 53	1 36	1 46
Londonderry	100·3	3 00	2 35	2 45	6	8	10	3 33	3 06	3 14
N.C.C. (from and to Belfast)										
Portrush	¶65·2	†2 35	1 13	1 45	8	16	12	†2 49	1 39	2 11
Londonderry	¶92·8	†3 20	2 10	2 50	8	10	10	†3 36	2 28	3 15
B. & C.D. (from and to Belfast)										
Newcastle	37·1	§1 00	§1 00	‖1 10	8	11	12	1 23	1 20	1 31

* From Broadstone terminus, 2·2 miles, less than from Westland Row, in 1918
† *Via* Greenisland, reversing there, in 1918 (2.5 miles further); *via* Greenisland loop in 1939 and 1942
‡ Certain trains travel *via* Ballybrophy & Nenagh, 123·4 miles
§ 50 min. on Saturdays ‖ 60 min. on Saturdays ¶ 2·5 miles further in 1918

Restaurant and Buffet Cars

As to restaurant and buffet cars, in 1918 the G.S. & W.R., M.G.W.R., D. & S.E.R., and N.C.C. withdrew all such facilities; the G.N.R. maintained 6 restaurant and 4 buffet trains throughout. In 1939 the G.S.R. had developed its restaurant car service to 18 trains daily, together with 6 trains serving refreshments from Pullman cars, and 4 from small pantries—28 in all—but the whole of these are now withdrawn. The G.N.R. in 1939 had 6 restaurant car trains running and 18 with buffet or light refreshment service, 24 in all, of which all the restaurant car trains are still running, and 10 of the buffet trains, while this year a new restaurant car service has been inaugurated between Belfast and Londonderry, making a total of 18 trains now in operation. The N.C.C. total of 12 restaurant or light refreshment trains, which reached 12 in 1939, is at present 10, so that, despite war conditions, the amenities of travel, as well as speed and frequency, are being well maintained in Northern Ireland.

L.N.E.R. 20-ton Goods Brake Van

THE modern 20-ton goods brake vans of the London & North Eastern Railway are of the design illustrated on this page. In common with the other British railway companies, the L.N.E.R. in recent years has built all new vehicles of this kind on long-wheelbase underframes; this has improved their riding qualities, and this is especially marked on fast goods trains.

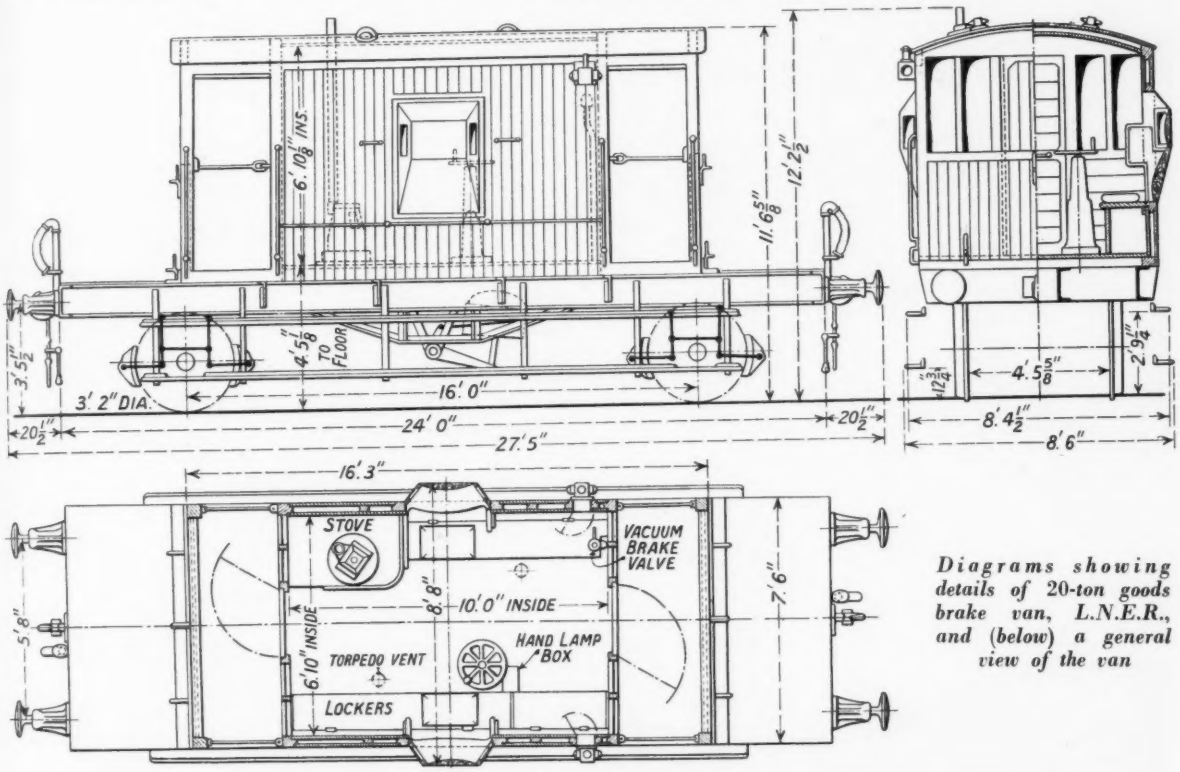
The vans, which are fitted with vacuum and screw hand brakes, have general dimensions as follow:—

Length over buffers	27 ft. 5 in.
,, ,, headstocks	24 ft.
,, ,, body	16 ft. 3 in.
Width over body	7 ft. 6 in.
Width over guard's projections ...	8 ft. 8 in.
Wheelbase	16 ft.
Journals	9 in. by 4½ in.

The underframe is of steel and fitted with screw couplings; long side-bearing springs and auxiliary springs are also fitted. The body is of wood with steel guard's lookouts. The guard's compartment is 10 ft. 6 in. long and is provided with the usual stove and hand-brake column, together with lockers for equipment. Fixed side lamps are also provided. Torpedo type ventilators are fitted on the roof.

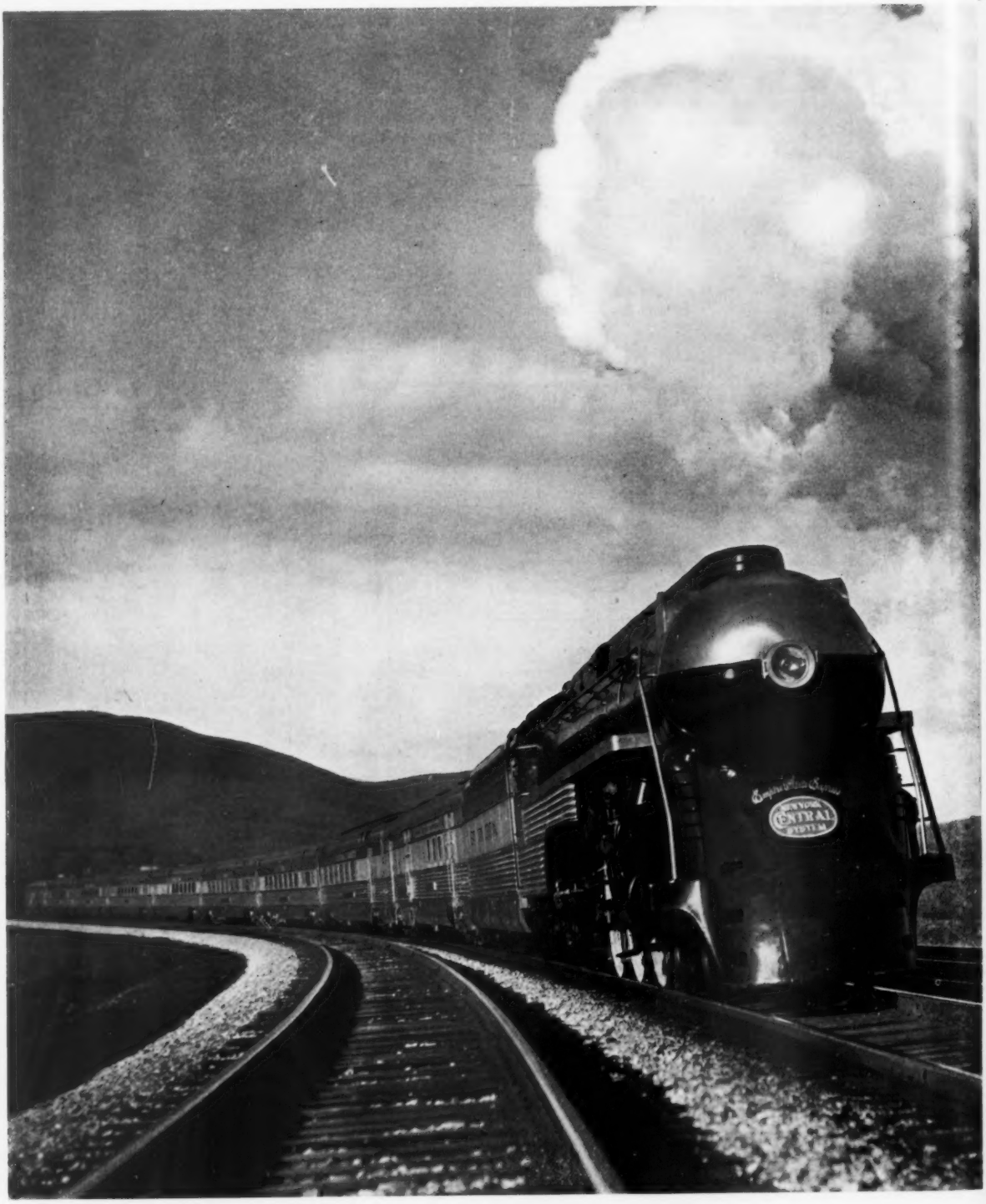
The ballast weights are comprised of cast-iron scrap in a concrete matrix, but the vans on the current programme will have all-concrete ballast, thus saving approximately 7 tons of scrap iron each van.

We are indebted to Mr. E. Thompson, Chief Mechanical Engineer of the London & North Eastern Railway, for the foregoing particulars and also for the originals of the illustrations reproduced.



Diagrams showing details of 20-ton goods brake van, L.N.E.R., and (below) a general view of the van

The Empire State Express



This streamline train of 16 *vehicles, including tavern lounge, dining, parlour, and observation lounge cars, and hauled by a* 300-*ton* 4-6-4 *locomotive, is the modern successor of a famous train of the New York Central which began to run on October* 26, 1891, *between New York and Buffalo.* (*See editorial note, page* 266)

RAILWAY NEWS SECTION

PERSONAL

Sir Frank Smith has resigned from his position as Controller of Telecommunications, Ministry of Aircraft Production. It is stated that other claims on his services affecting the Royal Air Force are such that he has decided to devote his attention mainly to them, but he has offered his future help and advice to the minister. During his tenure of office as Controller of Telecommunications, great advances have been made in radiolocation, and for his services he was created G.C.B. in the New New Year's Honours List.

Major J. M. Campbell and Mr. C. R. Wheeler have been appointed Joint Deputy - Controllers, Raw Materials, Iron & Steel Control, in succession to Mr. A. K. McCosh, whose resignation from the position of Deputy-Controller we announced last week. Major Campbell has been succeeded as Director for Foreign Ore by Mr. D. H. Kyle.

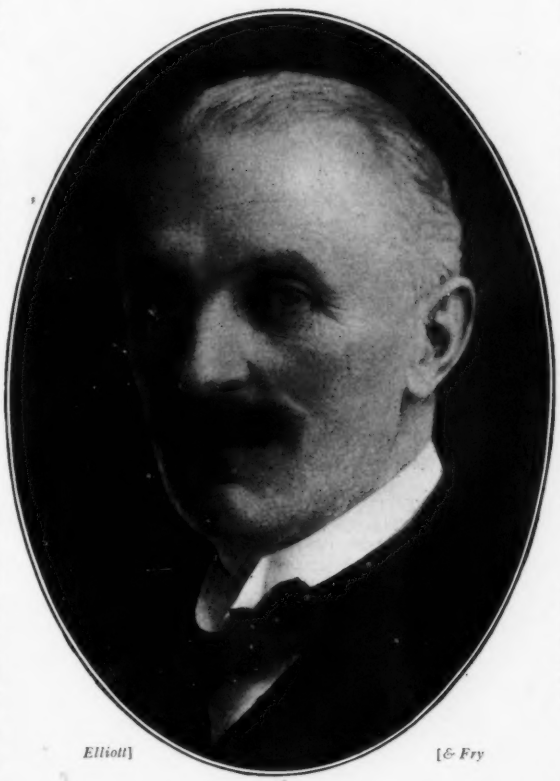
Sir John Forster, Chairman of the Railway Staff National Tribunal, has been appointed by the Government to review, and report on, conditions obtaining under the Merseyside Dock Labour Scheme.

We regret to record the death in America, on July 11 last, of Mr. R. P. C. Sanderson in his 84th year. Mr. Sanderson occupied the position of Manager of the London office of the Baldwin Locomotive Works from 1918-1926. During his stay in England he formed a great number of friendships in locomotive circles, and was an enthusiastic member of the Institution of Locomotive Engineers, of the Council of which he was for some time a member, as well as serving on various sub-committees. On resigning his position with the Baldwin Locomotive Company in London, he returned to the United States and was made an honorary life member of the Institution of Locomotive Engineers. On numerous occasions he took part in the discussions which were held after the reading of papers on locomotive subjects at meetings of the Institute, and he was recognised as an authority on locomotive practice.

Mr. F. A. Polgrean, Chief of the Publications Department, retired from the service of the Railway Clearing House on July 31. He has been associated with the Clearing House official railway maps, junction diagrams, and the Hand Book of Stations, since they were taken over from Mr. John Airey in 1895.

We regret to record the death on September 12, at his home, Eskmount, Goring-on-Thames, of Mr. Patrick Reginald Chalmers. He was a Director of Barranquilla Railway & Pier Co. Ltd. and the Salvador Railway Co. Ltd.

We regret to record the death on September 6, at the age of 68, of Mr. Lightly S. Simpson, formerly General Manager, United Railways of Havana. Mr. Simpson received his training in the Stratford Works of the former Great Eastern Railway, and, after serving with that company for 12 years, he joined in 1907 the Buenos Ayres & Pacific Railway. He eventually became Locomotive Running Superintendent before returning to England for war service in 1915. After holding various appointments in France he was promoted to the position of Chief Mechanical Engineer in charge of Railway Equipment & Rolling Stock, with the rank of Colonel. In that capacity he was responsible for the construction and equipment of large repairing shops for locomotives and wagons, and also for the maintenance of the whole of the rolling stock in France provided for the use of the British Expeditionary Force. On its formation in 1919, he was appointed Chief Mechanical Engineer of the Ministry of Transport, and in 1921 he became Chief Mechanical Engineer, Cordoba Central Railway. In 1929, Mr. Simpson was appointed General Manager, United Railways of Havana, and he held that position until his retirement in 1939.



Elliott] *[& Fry*

The late Mr. Lightly S. Simpson, C.B.E., D.S.O.

General Manager, United Railways of Havana, 1929-1939

Mr. Richard Mather, a Director and Chairman of the Skinningrove Iron Co. Ltd., and formerly Technical Director of the Tata Iron & Steel Co. Ltd., has been appointed a Director of Pease & Partners Limited.

L.M.S.R. ACTING C.M.E.

Mr. W. A. Stanier has been seconded to the Ministry of Production on special duties, and in his absence Mr. C. E. Fairburn has been appointed Acting Chief Mechanical Engineer. Mr. Fairburn's headquarters will be at Nelson Street, Derby.

The Crown Agents for the Colonies recently have made the following first class appointments :—

Mr. G. F. Cooke to be Assistant Engineer, Sierra Leone Government Railways.

Mr. T. G. Kenyon to be Assistant Accountant, Gold Coast Government Railway.

Mr. C. N. F. Sturrock to be Senior Storekeeper, Nigerian Railway.

Sir W. Charles Wright, Controller of Iron & Steel at the Ministry of Supply, has resigned for medical reasons. He will be succeeded by the deputy-controller, Sir J. M. Duncanson. Sir Charles Wright is a Director of the Great Western Railway Company and of a number of industrial undertakings.

Señor Amezaga, legal adviser to the British railway and tramway companies in Uruguay, has been adopted as the candidate of the Baldomir party for the office of President at the election next November. General Baldomir is the retiring President.

Mr. A. E. Sewell, Goods Manager, Scottish Area, L.N.E.R., has been released temporarily from his duties in this connection in order to carry out work on the improvement of understanding between railway and road interests. Mr. C. S. McLeod, Assistant Goods Manager, Scottish Area, will act temporarily in his place.

The late Captain G. H. Barnish, Marine Superintendent & Harbourmaster, Heysham, L.M.S.R., left £7,019.

Mr. George Sutherland, Chief Accountant, London & North Eastern Railway, whose death was recorded in our September 11 issue, entered the Audit Office of the former Highland Railway in 1895. He was in charge of the Locomotive Accounts, under the Accountant, from 1905 until 1913, when he was appointed Examiner of Departmental Accounts under the General Accountant of the former North British Railway. From February, 1920, until January, 1921, Mr. Sutherland's services were lent to the Ministry of Transport as Accountant to the Director-General of Civil Engineer-

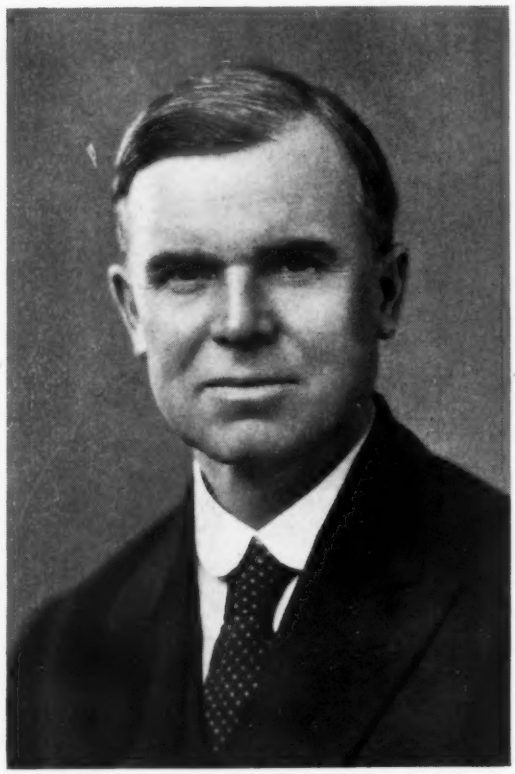
ing. At the latter date he returned to Edinburgh for the special task of preparing the accounting side of the North British Company's final claim against the Government, which went to arbitration. As a result of the amalgamation, he was transferred to London in 1923 as Special Auditor under the Chief Accountant, L.N.E.R. In 1925 he was appointed Assistant to the Chief Accountant, and three years later he became Divisional Accountant, Southern Area. In 1928 he succeeded Mr. C. H. Newton as Assistant Accountant, and in 1936 he became Chief Accountant.

Mr. Sutherland's funeral took place on September 9 at Morningside Cemetery, and among those who attended were :—

Mr. William Whitelaw, also representing the Chairman and Board of Directors, L.N.E.R.; Mr. R. J. M. Inglis, Divisional General Manager, Scottish Area representing the Chief General Manager and Chief Officers, L.N.E.R.; Mr. Vernon Gee, Divisional Accountant, Northern Division, L.M.S.R., also representing Mr. G. Morton, Chief Accountant, L.M.S.R.; Mr. L. C. Glenister, Assistant Accountant, L.N.E.R., also representing Mr. C. R. Dashwood, Chief Accountant, Great Western Railway; Mr. Farringdon, Finance Section, Ministry of War Transport, representing Mr. W. M. Hind, Principal, Finance Section, Ministry of War Transport; Mr. G. Reeves, Divisional Accountant, L.N.E.R.; Mr. T. Gaynor, Divisional Accountant, L.N.E.R., also representing Mr. R. G. Davidson, Chief Accountant, Southern Railway; Mr. R. McEwen, Locomotive Accountant, North Eastern Area, L.N.E.R., also representing Mr. A. E. Moore, Audit Accountant, Southern Railway; Mr. P. Young, Chief Accountant's Department, L.N.E.R., also representing Mr. L. C. Hawkins, Comptroller, L.P.T.B.; Mr. J. Ross, Engineer's Accountant, Scottish Area, L.N.E.R.; Mr. W. Knight, representing Mr. H. S. Alsop, Hotels Accountant, L.N.E.R.; Mr. W. Y. Sandeman, Engineer, Scottish Area, L.N.E.R.; Mr. G. S. Begg, Passenger Manager, Scottish Area, L.N.E.R.; Mr. E. D. Trask, Locomotive Running Superintendent, Scottish Area, L.N.E.R.; Mr. J. H. Hunter, Solicitor, Scotland, L.N.E.R.; Mr. H. B. Angus, District Goods & Passenger Manager, L.N.E.R., also representing Mr. C. S. McLeod, Goods Manager, Scottish Area, L.N.E.R.; Mr. A. E. Gibson, Chief Clerk, Chief Accountant's Office, Edinburgh, L.N.E.R.

Others present included :—

Mr. T. B. Maitland (Solicitor, retired); Mr. A. Hill (District Superintendent, retired); Mr. W. A. Fraser (Engineer, retired); Mr. J. Inglis (Locomotive Accountant, retired); Mr. W. Philip (Divisional Accountant, retired); Mr. J. Hay (Factor, retired); Mr. T. R. Hawkes (Locomotive Accountant). The following attended from the Chief Accountant's Department: Mr. W. Knight, Mr. J. Rankin, Mr. W. Gillie, Mr. H. J. Wilsher, Mr. R. E. Taylor, Mr. J. Stewart, and Mr. T. Anderson (Solicitor's Department.)



The late Mr. George Sutherland
Chief Accountant, L.N.E.R., 1936–42

Alderman G. S. Lindgren, a member of the Herts County Council, has been appointed Deputy Regional Commissioner for Civil Defence in the Midland Region. He is in the employment of the London & North Eastern Railway Company, which has granted him leave of absence.

Freight train climbing Cowan Bank, New South Wales Government Railways. Train engine "D50" class 2-8-0 No. 5139 piloted from Hawkesbury River to Cowan by "D53" 2-8-0 No. 5460

[Photo] [John Buckland

TRANSPORT SERVICES AND THE WAR—157

Cheap Travel for Transferred Workers

The Minister of Labour, after consultation with the Minister of War Transport, has modified the cheap travel scheme which enables transferred workers, subject to certain conditions, to visit their homes at a cost of 7s. 6d. for each return journey. When the Minister announced this scheme in Parliament on April 30 he said that, in view of the need to restrict railway travel during the winter months, the scheme would be suspended on September 15. This is now modified in favour of workers whose homes are in Northern Ireland or Eire, and in favour of workers engaged on agriculture. Irish workers who have not used both their cheap warrants will be allowed to use one of them during the winter months, and agricultural workers will be allowed to postpone both their cheap visits until the winter.

Hop-Pickers and Transport

Because of the more pressing demands of war-workers elsewhere, it has not been possible this year to provide the usual augmented road transport services to the hopfields. By travelling on normal road services, therefore, hop-pickers are causing hardhip to regular riders who rely on the vehicles to take them to and from their daily work. The London Passenger Transport Board has asked hop-pickers to use the railway services for essential travel, and to avoid using the restricted road services for pleasure riding and other social amenities usually associated with hop-picking.

The Ministry of Home Security has issued a warning to friends of hop-pickers in Kent against entering a restricted area without the permission of the police. Most of the hopfields in Kent are in a restricted area to which visits for the purposes of a holiday, recreation, or pleasure are prohibited. Only persons who are in possession of special police permits may visit relatives or friends who are hop-picking in Kent. These permits should be obtained from the local police by those in the hopfields, and then sent to the intending visitor.

Tunnel Shelters in London

As long ago as November 3, 1940, Mr. Herbert Morrison, the Minister of Home Security, outlined the Government's policy on the subject of deep air raid shelter and the extension by tunnelling of the deep shelter provided by the tube stations in London. Reference to the progress of the work was made in our issue of April 4, 1941 (page 401), and again in that of June 20, 1941 (page 688), the latter in connection with the references to the scheme in the fourteenth report of the Select Committee on National Expenditure.

Should the necessity have arisen, it was intended that the first of the new shelters should be opened towards the end of November, 1941, but the suspension of intensive air raiding on London permitted the intensity of construction work to be reduced, and work has been proceeding steadily up to the present time. The cost of the work, which was estimated at about £1,333,000, is being borne by the Exchequer, like that of other public shelter. The extensions, however, have been constructed with a view to their use after the war as train routes. The construction was undertaken by the London Passenger Transport Board as agent for the Ministry of Home Security, and the latter has in being a committee to manage the shelters. The Chairman of this committee, Sir George Wilkinson, announced on September 11 that the shelters were of the most modern type in the world, but that it was unlikely that any more would be built owing to the length of time they take to construct. No formal agreement exists with the London Passenger Transport Board as to payment for extensions which may be used for traffic in the post-war period, and no obligation lies upon the board to buy them at all.

Six of eight new tube shelters are ready for use this winter, but will not be brought into service unless the emergency arises in the form of heavy and continuous air raiding. The tunnels are from 75 ft. to 110 ft. below ground level, run side by side, and are divided by cross passages into 8 sections of approximately equal length. Each tunnel is also divided horizontally into an upper and lower deck fitted with bunks. Four canteens are provided on each floor and will be run by voluntary workers from the Women's Co-operative Guild in the southern area, and by Church organisations in the northern area; of the total of eight shelters approaching completion, four are north of the Thames and four south. In every shelter there are two medical aid posts, an observation bay, and an examination room. The individual shelter will hold some 8,000 persons, providing a total additional accommodation for approximately 64,000, which is being kept in reserve. Separate surface entrances are being provided, but, as every shelter is in close proximity to an existing tube station, emergency communication with the station also exists. Admission will be by ticket, but none is being issued at present.

London Bus Stops Reduced

Considerable progress is being made by the London Passenger Transport Board in carrying out its policy of abolishing a number of stopping places for trams and buses in order to effect economies in fuel and rubber. Reference to this policy was made at page 89 of our July 24 issue. Already 650 bus, tram, and trolleybus stops have been eliminated, and, on September 10, stopping posts between New Cross Road and Woolwich, and between Southwark and Norwood tram terminus were dealt with. By the end of September some 2,000 removals or changes will have been effected. Approximately 10,000 stopping places in the Central area are being reviewed, and these affect 430 bus and 100 tram and trolleybus routes. All stops are carefully examined before a change is made. In some cases stops have been eliminated; in others they have been re-sited. Others, again, are being altered from "fixed" stops to "request" stops. In certain parts of London away from the Central Area there are no signposted stopping-places, and these places are now to be provided for the first time, beginning in the Wembley area on September 19. Whenever a stopping-post has to be removed or re-sited, notice is given by small posters on the posts. It is hoped that the bulk of the revisions will have been made by the time the homeward peak traffic and blackout periods coincide.

Railways War Effort

An example of the value of the contribution being made to the war effort is the fact that the L.M.S.R. hauls loaded freight wagons for a total distance of over 30 million miles every week. In addition, an average of 350 special O.H.M.S. trains was run every week during the first six months of this year—an increase of 35 per cent. over the corresponding period in 1941.

Use of London Taxis

In view of the restrictions on private motoring and the curtailment of bus services, there have recently been heavily increased demands for taxicabs in the London area, where the total fleet in service now numbers about 4,500 compared with 7,600 before the war. In the London area the petrol allowance to taxicabs is 90 gal. a month, which is sufficient in the case of a cab in good condition for running 50 to 55 miles a day. There is a feeling among various cab owners and drivers, and their representative organisations, that the most effective use is not being made of the London cabs by reason of the existing legal restrictions. It is stated that on 75 per cent. of the journeys taxis capable of holding four persons carry only one, and that half the hirings are for journeys of a mile or less on routes already covered by bus services. The suggestion has been made that cab drivers should be authorised to endeavour to secure better loads by arranging for passengers to share accommodation, and that they should be per-

The L.M.S.R. has provided two coaches which are permanently stationed in a siding at Cheltenham Station to assist the Y.M.C.A. to provide sleeping accommodation for Servicemen passing through that town

mitted to refuse hirings which seem unnecessary and wasteful. To a limited extent, cab drivers already refuse hirings to outlying points which will result in empty return journeys, on the excuse that their petrol is insufficient for the trip.

Withdrawal of Green Line Coaches

Complete details have now been issued by the London Passenger Transport Board of the changes which will be made when the whole of the Green Line coach service, numbering 28 routes, is withdrawn on Wednesday, September 30, as briefly recorded at page 257 last week. About 11,500,000 miles a year will be saved, and substantial quantities of rubber, petrol, and diesel oil thereby made available for war purposes. Where the withdrawal of a coach route would leave passengers without means of travel to a main line station, existing London Transport bus routes will be extended to provide connections. Other local bus services will be strengthened to carry the essential traffic displaced. The following is a complete list of these extended or augmented bus routes :—

Coach Route Affected	Additional or Augmented Bus Services
2—Wrotham ...	New bus service between Swanley Junction and Wrotham, hourly.
5—Tunbridge Wells	New bus service between Sevenoaks and Tunbridge Wells, half-hourly. (Not catering for local traffic between Tunbridge Station and Tunbridge Wells, on which section higher minimum fare will apply.)
8—East Grinstead	Increased peak service on Route 409 between West Croydon and Caterham Station, by two additional buses an hour ; and extension of Route 409 between Caterham and East Grinstead half-hourly.
10—Reigate ...	Increased peak service on Routes 80 and 80A, times to connect conveniently with Route 406.
18—Guildford ...	Extension of Route 72 between Hook and Esher, at 20-min. intervals in peaks, half-hourly at other times.
20—Chertsey ...	Increased service on Route 131 by two additional buses an hour.
21—Staines ...	Increased service on Route 216 by one additional bus an hour to Staines, and one to Sunbury.
23—Ascot 23A—Sunningdale ...	New bus services between Staines and Sunningdale, and between Staines and Ascot, each at hourly intervals in peaks, at two-hourly intervals at other times.
26, 26A—Windsor, Farnham Common	Increased peak service on Route 81 between Hounslow and Slough, by two additional buses an hour.
33—High Wycombe	Increased service on Route 455 between Uxbridge and High Wycombe, by two additional buses an hour.
34—Chesham ...	Supplementary peak service between Chalfont St. Peter and Gerrards Cross Station, timed to connect conveniently with trains.
35—Aylesbury *via* Amersham	New bus service between Amersham and Wendover, hourly. Extension of Routes 345 346 from Northwood to Harefield at peaks, and to Mount Vernon at other times, hourly.
40, 40A—Aylesbury *via* Tring, Hemel Hempstead	Increased service on Routes 301 and 302, at peaks Monday to Friday, and on Saturday and Sunday afternoons, by one additional bus an hour on each service.
45, 46—Luton ...	Increased peak service on Route 321 by three additional buses an hour. Increased peak service on Route 355 between Radlett and St. Albans by one additional bus an hour ; and extension of Route 355 between Radlett and Boreham Wood half-hourly in peaks, hourly at other times. Increased service on Route 84 between Arnos Grove and St. Albans, by two additional buses an hour in peaks, one an hour at other times.
47, 47A—Hitchin, Welwyn Garden City	New bus service (peaks only) between New Barnet and Hatfield (Birchwood Avenue) *via* Barnet By-pass, hourly.
49—Hertford ...	Increased service on Route 310 by two additional buses an hour in peaks and on Saturday and Sunday afternoons ; and diversion of alternate buses between Enfield Town and Waltham Cross *via* Cambridge Road and Bullsmoor Lane.
52, 53—Epping, Bishops Stortford	Increased service on Route 396 between Epping and Bishops Stortford by two additional buses an hour in peaks and on Saturday and Sunday afternoons, and one an hour at other times. Increased service on Route 10A by two additional buses an hour between Leytonstone and Epping in peaks, and by one an hour between Leytonstone and Loughton at other times.
54—Romford ...	New bus service (peaks only) between Leytonstone and Romford, at 15-min. intervals ; and increased service on Route 66 at other times, by one additional bus an hour.
55—Brentwood ...	Extension of Route 86 between Romford and Chadwell Heath and increased peak service on Route 86 throughout by two additional buses an hour.
58—Corbets Tey ...	New bus service (peaks only) between Victoria and Hornchurch Station at 15-min. intervals.
59, 59A—Grays ...	New bus services between Rainham and Grays *via* Aveley, at 15-min. intervals in peaks, 20-min. intervals at other times ; and between Rainham and Grays by direct route half-hourly at peaks, hourly at other times. Increased peak service on Route 103 between Becontree Heath and Rainham by two additional buses an hour ; and increased joint service in peaks between Barking and Rainham, by three additional buses an hour.

Weekly season tickets on Green Line coaches will not be issued in respect of the broken week beginning September 27. Four-weekly season tickets will not be issued after September 15. A proportionate refund will be made to holders of tickets which have not expired by September 29.

Passengers are advised not to buy return tickets (normally available for a month) unless they intend to return before September 30.

Berlin Station Closed

Alexanderplatz Main Station, situated between Friedrichstrasse and Schlesischer Stations, was closed for passenger and baggage traffic as from August 15. This is said to be due to the dislocation of long-distance passenger traffic originating from Berlin, a development which is the result of the curtailment of passenger trains and the consequent overcrowding of those still running. In peacetime the main stations in the central part of Berlin, such as Zoologischer Garten, Friedrichstrasse, and Alexanderplatz, were the points at which most long-distance passengers boarded trains, although the latter did not start from those stations. To secure seats passengers now prefer to board long-distance trains at the stations at which the latter commence their journeys, that is to say, for westbound trains at Schlesischer Station in the eastern part of Berlin, and for eastbound trains those for south-eastern Germany at Charlottenburg Station in the western part of Berlin. In view of the limited capacity, Schlesischer and Charlottenburg Stations have been unable to cope with the increased passenger traffic, and a recent order by the Berlin Reichsbahndirektion decrees that Charlottenburg Station shall cease to be a departure station for the greater number of eastbound trains (for instance, for Poznan in Poland, or for Upper Silesia) ; passengers will have to use the adjoining station, which is Zoologischer Garten. To prevent the development of a similar situation at Alexanderplatz Main Station, the latter has now been closed to passenger and baggage traffic. The Alexanderplatz Station of the S-Bahn is unaffected and can be reached by changing into Metropolitan trains at Charlottenburg Station (from the west) or at Schlesischer Station (from the east). Express goods traffic still will be handled at Alexanderplatz Main Station but only between the hours of 7 a.m. and midnight.

More Producer-Gas Buses

The Birmingham & Midland Motor Omnibus Co. Ltd. is operating producer-gas buses between Birmingham and Evesham.

The first producer-gas bus to be worked in Newcastle-upon-Tyne went into service on September 8. It is owned by the United Automobile Services Limited and is a 32-seat single-deck vehicle operating between Newcastle and Whitley Bay. We had the opportunity of viewing a trial trip of this vehicle in Newcastle on the previous day, and its power plant, which is of the G.E.P. type modified with the Morison water filter, proved capable of meeting all the demands which were made of it. The United Automobile Services Limited has already worked some 78,000 service miles with its gas-producer vehicles in other areas on the North-East Coast, representing a saving of 9,500 gallons of petrol.

Producer-Gas in Australia

Recent reports indicate that there are about 36,000 producer-gas vehicles in Australia; a few of these are low-power railcars. The price of charcoal fuel is fixed, and at Sydney is equivalent to £9 6s. 8d. a ton wholesale and £11 13s. 4d. a ton retail. Charcoal fuel may be manufactured and sold only under licence, and only officially-tested gas producers reaching a specified standard of performance may be offered for sale.

Producer-Gas in South Africa

Measures for the production of charcoal suitable for producer-gas road vehicles are being prepared by the Government of the Union of South Africa. Road tests conducted with a view to obtaining an inexpensive and easily-worked producer-gas plant showed that a consumption of about 1½ lb. a mile of the charcoal available would be needed for a 3-ton lorry. A few months ago the commercial price of charcoal was approximately 0·6d. a lb.

Road Transport Restrictions in Eire

Acute shortages of rubber and liquid fuel have caused the Government of Eire to impose further restrictions on the use of road transport. As from October 1 road haulage vehicles will be placed under the control of the Great Southern Railways Company, or "authorised persons working in co-operation with the railway."

Motor Racing Ban in the U.S.A.

The Office of Defense Transportation has issued an Order banning motor racing in the U.S.A. as from July 31. The prohibition covers all motor vehicle meetings, including so-called "midget" cars and motorcycles.

Road Motor Control in the U.S.A.

The Office of Defense Transportation issued a drastic Order on September 8 controlling virtually all commercial vehicles in the U.S.A. The Order comes into force on November 15 and requires all such vehicles to carry a certificate of war necessity, without which they will not be able to obtain petrol, tyres, inner tubes, and accessories. It is estimated that approximately 5,000,000 lorries, 150,000 buses, and 50,000 taxicabs are affected.

Only recently a U.S.A. Government Order was issued placing restrictions on taxicabs.

The Bus Industry in Scotland

The map which we publish below is a companion to that reproduced at page 91 of our July 24 issue, showing England and Wales, and is drawn to approximately the same scale. It thus completes Great Britain. As will be noticed, there is a substantial area in the North of Scotland which is not served by any large railway-associated bus company, but this sparsely populated and often mountainous area relies almost exclusively on road transport for its connections with the outside world. There are a number of old-established bus routes, usually based on a railway station, of which that between Garve and Ullapool is a noteworthy example.

Unlike England and Wales, Scotland did not possess a well-organised bus industry (excepting in certain localities), until after the railways secured their general road powers on August 3, 1928. The Edinburgh neighbourhood had been served since 1905 by the Scottish Motor Traction Co. Ltd., and this company extended its area of operations by the acquisitions of the Dundee Mechanical Transport Company in 1920; of William Young & Sons, of Bathgate, in April, 1923; and of Brook & Amos, of Galashiels, in April, 1926. The areas thus secured still represent substantially the territory directly served by the Scottish Motor Traction Co. Ltd., namely, from Edinburgh to Glasgow, between Edinburgh and the Border, and in the neighbourhood of Dundee.

In February, 1929, the company secured substantial interests in many other Scottish bus undertakings and negotiated with the railways with regard to the co-ordinated working. The present company, which acquired the older one as a going concern, was incorporated on August 15, 1929, as the outcome of an agreement with the L.N.E.R. and L.M.S.R. whereby the railways acquired substantial shareholdings in the S.M.T., which, by securing control of many important bus undertakings, became the parent company of a group covering most of Scotland south of Inverness. During the next year or two the S.M.T. increased its own interests fairly substantially, and the L.M.S.R. also acquired outright a number of independent bus businesses and subsequently turned them over to the S.M.T.

The broad arrangement adopted was that the S.M.T. should continue to maintain services radiating from Edinburgh, Bathgate, Dundee, and Airdrie, and that services in the remaining territories should be merged into three subsidiary "area" companies, namely, W. Alexander & Sons Ltd., the Central S.M.T. Co. Ltd., and the Western S.M.T. Co. Ltd.

W. Alexander & Sons Ltd. was registered in Edinburgh on May 23, 1924, and was one of the undertakings in which the S.M.T. acquired a substantial interest in February, 1929. It covers a very wide territory extending northward from the Helensburgh-Glasgow-Linlithgow line up to Inverness and Banff. In March, 1930, the S.M.T. purchased (on behalf of Alexander) the Scottish General Omnibus group of companies, one of which, the Scottish General (Northern) Omnibus Co. Ltd., included (from August, 1930) the Deeside motor services instituted by the old Great North of Scotland Railway as long ago as May 2, 1904. The whole of the Scottish General group was handed over to Alexander's in August, 1930, and the individual companies have since been liquidated. In May, 1931, Alexander & Sons arranged with Kirkcaldy Corporation to provide all the bus services in the burgh, and in May, 1934, made a similar arrangement with Perth. In March, 1935, Alexander purchased the tramway services operated by the Dunfermline & District Traction Company and the Falkirk & District Traction Company (the buses had been acquired previously) and the tramcars have since been withdrawn and replaced with buses.

A business which is a subsidiary of Alexander & Sons, but has retained its separate identity, is that of the Pitlochry Motor Co. Ltd. This company was registered in Edinburgh on September 4, 1929, and serves the Pitlochry territory, and a link to Perth, with a small fleet of 21 vehicles.

The Central S.M.T. Co. Ltd. was incorporated in Edinburgh on June 23, 1926, as the Glasgow General Omnibus & Motor Services Limited. It became associated with the S.M.T. in February, 1929, but was not then a subsidiary. In May, 1930, the L.M.S.R. acquired all the issued shares at 9s. a share, and the company was subsequently incorporated in the S.M.T. group. As from January 1, 1932, it took over the undertakings of Stewart & McDonald Limited, and J. W. & R. Torrance Limited, and on June 18, 1932, the company changed its title to the Central S.M.T. Co. Ltd. As will be seen from the map, the company's services covered the important industrial areas on the north bank of the Clyde, and in Lanarkshire. In the latter area there was an important statutory undertaking known as the Lanarkshire Traction Company, which was formed in 1898 as a tramway undertaking, but abandoned its trams in favour of buses on October 6, 1930, and February 14, 1931. In July, 1932, the S.M.T. acquired control; the business was converted into a public company under the Companies Act on September 9, 1933; and in September, 1934, the control was transferred to the Central S.M.T. Co. Ltd.

The Western S.M.T. Co. Ltd. was incorporated in England on September 24, 1913, as the Scottish General Transport Co. Ltd., as a unit of the British Electric Traction Company's organisation, controlling three of the B.E.T. tramway companies in south-west Scotland. It began motorbus services on January 1, 1914. Control was acquired by the Scottish Motor Traction Co. Ltd. in November, 1931, and the company was made an "area" company in the S.M.T. organisation; its name was changed to the Western S.M.T. Co. Ltd. in June, 1932. It

Approximate areas served by principal motorbus companies in Scotland

absorbed many S.M.T. subsidiaries in its area, including the Midland Bus Services Limited, of Airdrie (as from April 1, 1932), and the Ayrshire Pullman Services (which had been purchased outright by the L.M.S.R.). The Kilmarnock Corporation Bus Services were taken over in 1932. A statutory subsidiary company is the Greenock Motor Services Company (formed in 1871 as the Greenock & Port Glasgow Tramways Company; name changed August 3, 1928), which in November, 1929, bought the Gourock Pullman Services jointly with the L.M.S.R.

The Rothesay Tramways Co. Ltd., a former B.E.T. company, which introduced motorbuses in June, 1925, is a Western S.M.T. associate. Its trams were finally abandoned on September 30, 1936. The S.M.T. acquired a controlling interest in November, 1931.

Catering for L.P.T.B. Staff

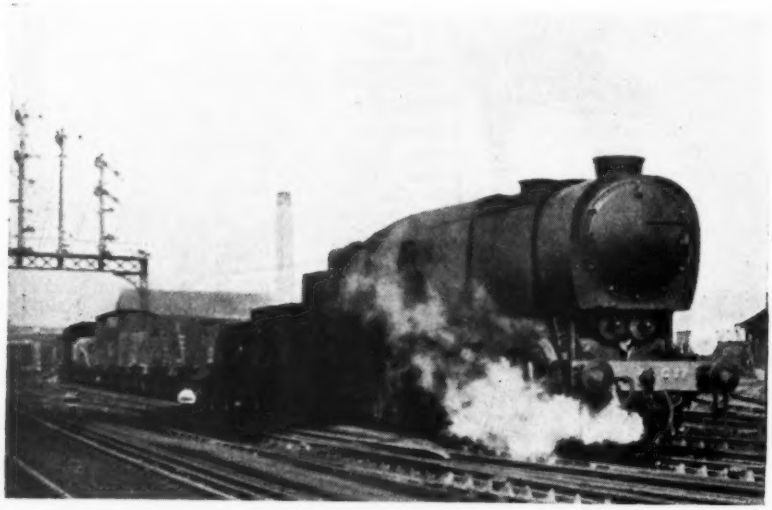
Some recently-published figures reveal a considerable increase in the catering work for staff of the London Passenger Transport Board. When war broke out there were 113 canteens of all types at garages, depots, railway stations, and other points; since then 21 canteens have been added to this number, and a further eight are being made ready, which will bring the total to 142. Among the recent additions are mobile canteens of a new type (briefly described in our September 4 issue) which are intended to travel to points, mainly terminals, on bus routes at which the staff at present are unable regularly to obtain good food. The importance of their being able to do so, particularly in cold weather, has led the board to make arrangements also for railway permanent-way workers, for whom hot meals are supplied in insulated containers conveyed by passenger train to the stations nearest to which the gangs are working. Similar arrangements are being made for permanent-way staff on tram and trolleybus routes.

The staff, which numbers 78,000 together take more than 86,000 meals or snacks daily, 30,000 of which are full meat meals. Much of the food consumed at the canteens is provided by the board's own farms, which comprise 128 acres under cultivation; it is estimated that, in the coming months, they will supply about 80 per cent. of the canteens' requirements of vegetables. The prices charged are low, and a two-course dinner costs less than a shilling.

The catering staff of the L.P.T.B. numbers 1,472, of whom 1,366 are women and 106 are men. About 150 male canteen workers are now on service and it is necessary constantly to train fresh personnel; for example, about 100 cooks are trained every year.

U.S. Railways Economise in Materials

In a statement issued by the Association of American Railroads, it is shown that the railways in that country are aiding in the war effort by saving thousands of tons of vital and scarce materials. Normally they use nearly 50,000 tons of copper a year, but by reducing the amount used in locomotives, air brakes, signal apparatus, telephone and telegraph communication, and in journal boxes, the railways have been able to bring about a saving of about 10 per cent. in copper. Rail angle bars which formerly varied from 24 in. to 39 in. in length have now been standardised at 24 in. and the resultant saving amounts to 12,000 tons of steel a year. A special joint committee of the Mechanical and Purchases & Stores Divisions of the Association, has completed a study as to possible savings in the use of rubber by American railways. This committee discovered that without interfering with safety or efficiency, fibre, plastics, felt, reclaimed rubber, and various other materials can be used in making approximately 170 different parts and appliances which now use rubber. In the manufacture of nearly 70 other items made either entirely or partially of rubber, the committee found that the amount of this material can be reduced. Reference was also made to the use of tin by the railways in considerable quantities. Revised specifications have been prepared which provide for a reduction in the amount used; babbit metals which are also widely used by the railways have been developed so as to contain less tin. Railways use approximately 75,000 different articles, and the association remarks, "any saving which they make in the use of critical and scarce materials is therefore substantial."



One of the Southern Railway new "Q1" class 0-6-0 freight locomotives in traffic. Details of these locomotives were given in our April 17 issue

Questions in Parliament

Below are summarised Answers to Questions in Parliament affecting transport. The Minister concerned and the date of the Answer are given in parentheses

Coal Gas

The use of coal gas as a propellant for vehicles has been made subject to licence, in order to conserve fuel and materials. The licences, which are issued by Regional Transport Commissioners of the Ministry of War Transport, will only be issued to vehicles engaged on essential work. The price of gas supplied to vehicles should not exceed that charged to ordinary domestic consumers, which is subject to the control imposed by the enactments relating to the particular undertaking concerned; but a charge would no doubt be made for compression, and this is not subject to control. (Major G. Lloyd George, Minister of Fuel & Power, September 8).

Oil Saturated Waste

Adequate arrangements are in operation for recovering and treating oily rags, cotton waste, and wipers from Government factories, the Services, and the railway companies. A considerable number of processing firms throughout the country treat such material arising from commercial sources; but further measures may be necessary, and I am investigating the matter. (Mr. C. U. Peat, Joint Parliamentary Secretary, Ministry of Supply, September 8).

Sleeping Accommodation for Troops

Voluntary organisations run hostels for members of the Services in towns where there is a demand for sleeping accommodation for troops stranded while travelling or spending a night's short leave there. The voluntary organisation running a hostel is given a large measure of assistance from public funds. Sleeping accommodation is also provided at many important railway stations. Where existing accommodation proves inadequate further provision is always considered and made where practicable. (Sir James Grigg, Secretary of State for War, September 8).

Clyde-Forth Canal Proposal

The proposal for the construction of a sea level canal capable of conveying battleships from the Clyde to the Forth was the subject of a report by a committee appointed in 1929 by the Minister of Transport. The report was published in August, 1930. As the Minister responsible for post-war planning in Scotland, I shall maintain the closest contact with the Minister of War Transport on all proposals for transport development in Scotland. (Mr. T. Johnston, Secretary of State for Scotland, September 8).

Road Haulage Scheme

I am aware that certain features of the Road Haulage Scheme have not proved altogether satisfactory. The scheme is now being reviewed in the light of the changing conditions of the war, and the Minister of War Transport will issue a statement as soon as he has made the

necessary decisions. (Mr. P. J. Noel-Baker, Joint Parliamentary Secretary, Ministry of War Transport, September 8).

Traffic Lights

Local authorities are now carrying out a further review of traffic-light signals at T junctions and others, in order to discontinue those which are no longer justified on traffic or safety grounds. The estimates so far received indicate that approximately 18 per cent. of the total numbers have been, or will be, altogether discontinued and that, in addition, about 48 per cent. are being, or will be, worked for a reduced number of hours. (Mr. P. J. Noel-Baker, September 8).

Transport of Fruit

I am informed that some consignments of plums from Southern England were unfit for human consumption when they arrived in Scotland. They were only a small proportion of the total quantity transported. The railway companies have made every effort in their power to ensure that these plums, and all soft fruit sent by rail, shall have rapid transit. Even in peacetime there was always a certain wastage during transport to market. At the present time, when the demands on the railways are so heavy, there are bound to be occasional delays on long journeys, such as that from Kent to Scotland, from which highly perishable goods must suffer. (Mr. P. J. Noel-Baker, September 8).

Rhodesian Railways

The question of the State acquisition of the Rhodesian Railways will be discussed at the railway conference which the three Governments interested had previously agreed should be held to consider certain other railway questions. As the conference is to be preceded by an investigation by experts who, according to present information, cannot begin their task before November or December next, it is unlikely that it will take place before the New Year. (Mr. Harold Macmillan, Under-Secretary of State for the Colonies, September 9).

L.P.T.B. Employees and the Forces

For some time the Ministry af Labour, with the full co-operation of the London Passenger Transport Board, has been investigating the staffing of the road transport undertakings of the London Passenger Transport Board. Reports on some sections have now been received and are under examination. The possibility of substituting staff in order to release men of military age has not been overlooked. (Mr. P. J. Noel-Baker, September 9).

Rail Transport of Flowers

I greatly regret that the present transport position has made it necessary to prohibit the transport of flowers by rail. The prohibition will be withdrawn as soon as the need for it is over, but that is unlikely to happen before hostilities have ceased. (Mr. P. J. Noel-Baker, September 9).

Solihull Coal Stocks

I am making inquiries as to the number of railway wagons unloaded at the Solihull reserve coal dump by the contractor employed by the Minister of Fuel & Power, and the number of such wagons reported as damaged in the course of unloading. I would not like to accept that the number damaged is between 15 and 20 per cent. of the number unloaded without inquiry, but of course if the number were anything like that, I would make the strongest representations to those concerned. (Mr. P. J. Noel-Baker, September 11).

Railway Station Staffs

I regret that I have not been able to obtain at short notice up-to-date information as to the progress made in the setting up of canteens for station staff in railway stations throughout the country; how many are in operation and at what places; and what supplies are available for the workers to purchase. I have, however, given instructions that it shall be immediately prepared. (Mr. P. J. Noel-Baker, September 11).

Travel Warrants

The railways have arranged to start the important new scheme of issuing travel warrants for the Armed Forces in a form valid as a ticket on October 1, but its operation in any particular area will depend on the delivery of supplies of the new warrants. Orders for these warrants have been given but supplies may not be available in all areas by that date. The new form will be fully equivalent to a railway ticket and no check will be required at the booking office. (Mr. P. J. Noel-Baker, September 11).

South Africa's War Effort

The Hon. F. C. Sturrock, Minister of Railways & Harbours in the Union of South Africa, who is visiting this country, in the course of a broadcast on September 11, said that the workshops of the Union were mobilised for war service under a Directorate of War Supplies which had a remarkable record of achievement. The quantities and variety of munitions that had been produced would have seemed a rather wild impossibility but for the fact that the task had been accomplished. He was more directly concerned with his own Department—that of railways and harbours—which had in actual operation become the Union's Ministry of War Transport.

This administration was the largest single organisation in South Africa. It employed more than 130,000 persons and its many workshops were staffed and equipped on a scale and for a range of manufacture not to be found elsewhere in Africa. The system covered 13,000 miles of railways and 17,000 miles of road transport; control of the ports was also part of its responsibility. Apart from all internal transport requirements, the handling, provisioning, and repair of naval and merchant vessels was now on a huge and unprecedented scale. And, notwithstanding meeting all the essential wartime demands on the transport resources, no less than 11,000 railwaymen were serving in the fighting forces.

The enginering industry of the Union—the extensive mine workshops—factories of every variety—were making their contribution to the materials of war that were flowing out in an ever increasing stream.

Fortunately, the Union possessed large iron deposits on which there had been established considerable steel works without which production of many vital things would have been impossible. Thanks to its geographical position and to the supplies and the skilled manpower available, the Union had been in a position apart from general productive capacity, to carry out a big scale rapid repair of ships, tanks, armoured cars, and other equipment. The Union had come to be known—quite rightly—as the repair shop of the Middle East. Damaged ships had been made seaworthy again, hundreds of tanks and other armoured vehicles that might have been rusting in the desert had been put back into effective service.

The spirit of the people in the factories and the workshops and in the other essential services that had to be maintained on a wartime basis had been one of sustained determination in meeting the demand of and needs of the ever-changing situation.

Henry Spurrier Memorial

At an informal lunch of Members of Council of the Institute of Transport, held at the Howard Hotel, Norfolk Street, W.C.2, on Tuesday last, September 15, Mr. E. S. Shrapnell-Smith, on behalf of the Henry Spurrier Memorial Committee, handed to Mr. J. S. Nicholl, C.B., President of the Institute, the Trust Deed entrusting the administration of the fund to the Council of the Institute. Mr. Nicholl presided at the ceremony. The Henry Spurrier Memorial Committee was represented by Mr. Shrapnell-Smith, Mr. Horace Shankland, Mr. William Frederick Mallender, and Mr. E. L. Cadwallader. Sir Arthur Stanley, the remaining member of the committee, was unavoidably absent. Among those present at the lunch were:—

Messrs. S. E. Garcke (Past President); A. A. Liardet (Managing Director, Leyland Motors Limited); V. A. M. Robertson (London Transport); C. H. Sutherland (L.M.S.R.); M. A. Cameron (L.N.E.R.); H. E. O. Wheeler (Southern Railway); Gilbert S. Szlumper (Railway Companies' Association); J. B. Osler (Carter Paterson & Co. Ltd.); P. E. R. Graefe (Maidstone & District Motor Services Limited); L. Lydall; R. Stuart Pilcher (Manchester Corporation; J. H. Stirk; A. Henderson; and J. H. Turner.

The Henry Spurrier Memorial Committee has so far collected the sum of £13,600 to establish and maintain scholarships, financial grants, and lectures on road transport, in memory of the work of the late Henry Spurrier (who died on March 4, 1942) in advancing the science or art of road transport. The committee has handed to the Institute of Transport an initial sum of £10,000 under the terms of a trust deed which gives the Council of the Institute of Transport considerable discretion in its expenditure towards achieving the desired objects. Mr. Shrapnell-Smith, in making the presentation, said that he knew of no similar fund, and paid tribute to the business methods of Henry Spurrier, whom he had known for 47 years.

Staff and Labour Matters

Railway Wages

The delegate conference of the National Union of Railwaymen, which was held on September 1 rejected the offer of the Railway Executive Committee, details of which were recorded in our August 28 issue, and the claim of the union for an increase of 10s. a week has been referred to the Railway Staff National Council.

The claim of the Associated Society of Locomotive Engineers & Firemen for increases ranging from 4s. to 12s. a week in the rates of pay of drivers, motormen, firemen, and engine cleaners, which had been rejected by the Railway Executive Committee, has also been referred to the Railway Staff National Council.

If agreement is not reached on the claims at the Railway Staff National Council they will be submitted to the Railway Staff National Tribunal.

Notes and News

Argentine Railway Services Reduced.—Curtailments in suburban railway services in Buenos Aires due to fuel shortage are announced in timetables which have just been issued, reports Reuters.

Edward Laycock Limited.—In *The London Gazette* of September 1, 1942, it is announced that the name of this company was on that date struck off the register and the company thereby dissolved.

Ransome & Marles Bearing Co. Ltd.—Net profit for the year to June 30 last, after all charges, was £119,434 (£113,295). The final dividend is 15 per cent., against 11 per cent., again making a total of 20 per cent. for the year.

Canada's Gift to British Railwaymen.—On Tuesday last Mr. Vincent Massey, the High Commissioner for Canada, on behalf of the Ladies Auxiliary of the Brotherhood of Locomotive Engineers of Canada, presented a Mobile Trailer Kitchen Unit to the London Railwaymen's Canteens Association. The ceremony took place at the L.M.S.R. Kentish Town Motive Power Depot.

Railway Rates Tribunal.—As from September 10, the postal address of the Railway Rates Tribunal is Wellington House, 125-130, Strand, London, W.C.2. The telegraphic address is Railtrib, Rand, London, and the telephone number is Temple Bar 9284. The office of the tribunal is on the third floor of Wellington House—entrance from Lancaster Place (leading to Waterloo Bridge).

Companhia de Mocambique.—At the adjourned extraordinary meeting of this company held in Lisbon on July 6, 1942, new statutes were adopted. The ordinary general meeting will be held on October 7, 1942, at noon, at the offices of the company in Lisbon, 10, Largo da Biblioteca Publica, for the purpose of considering the accounts for the year 1941, and electing presiding officers and secretaries for general meetings, directors, and members of the fiscal council in accordance with Articles 15 and 29 of the new statutes.

Charles Roberts & Co. Ltd.—For the year to March 31, 1942, the profit, after providing for interest on debentures and all outgoings, was £400,175, against £332,475. Depreciation of wagons takes £67,985 (£64,008), depreciation of buildings and plant, £25,000 (£23,000), and taxation £260,000 (£200,000), leaving a net profit of £47,190 (£45,466), and £28,791 was brought in. The allocation to debenture sinking fund is £6,874 (same) and the preference dividend takes £10,156. Dividend on the ordinary stock is again 15 per cent., less tax, and requires £27,015, leaving £31,936 to be carried forward.

Institute of Transport Oflag VI B Study Group.—The inaugural meeting of this study group of prisoners-of-war at Oflag VI B was held on April 21, since when it has met twice weekly. The first four meetings were devoted to the subject, "Rights and Duties of Transport Undertakings," under the guidance of Lieutenant Tattersall. The next two meetings were devoted to "Port Administration and Shipping" with Captain Carnio in charge, and thereafter the following subjects were treated in the order shown: "The British Railway System," by Captain Forester Fielding (Chairman of the group); "The Road Traffic Act, 1930," by Lieutenant Bibbings; "Airways Organization," by Squadron-Leader Long; "Leicester City Transport," by Lieutenant Thomson; "The Road & Rail Traffic Act, 1933," by Lieutenant Bibbings; "Railway Lay-outs and Passenger Station Working," by Captain Sewell (Secretary of the group); "Freight Train Working," by Captain Forester Fielding; "Coastal Shipping," by Lieutenant Brown; and "Cuban Railways," by Lieutenant Bryan. Brief reference was made in our September 11 issue to Institute of Transport examinations for prisoners-of-war.

L.M.S.R. Telephone Information Bureau.—It is announced that telephone requests for travel information on the L.M.S.R. "At Your Service" Bureau, at Euston Station, have broken all previous records during the past year. More than a million and a quarter enquiries, representing an average of 3,500 every day in the year, have been received.

More Restrictions on Use of Paper.—A new Control of Paper Order issued by the Ministry of Supply, which came into force on Monday last, places more restrictions on the use of paper. An important new provision is the prohibition on using for any document, leaflet, pamphlet, report, letter, or memorandum, a greater quantity of paper than is reasonably required for the purpose.

Fuel Shortage Warning.—Major G. Lloyd George, Minister of Fuel & Power, stated recently that coal production was 250,000 tons a week less than the country required. There were 13,000 more men employed in the mining industry than a year ago, but output was down by 70,000 tons a week. The Minister added that it might become necessary either to inflict hardship on the people, or to close some factories this winter. He appealed to consumers to economise.

Gleneagles Hotel.—Mr. John Armstrong, the Labour Director of the Ministry of Fuel & Power, and ex-Vice-President of the Scottish Mineworkers' Union, has informed Sir Patrick Dollan, Chairman of the Scottish Industrial Fuel Economy Committee, that Gleneagles Hotel and grounds are to be taken over by the Ministry as a rehabilitation home and rest centre for mineworkers convalescing after injury. He said that Gleneagles Hotel had accommodation for 600 patients, and was considered as well adapted for the treatment of miners who had been injured or who had been rendered unfit by rheumatism or similar illnesses. Patients would be sent direct from local hospitals to Gleneagles Hotel for rehabilitation treatment.

Licensing of Exports.—Under the Export of Goods (Control) (No. 38) Order, 1942 (S.R. & O., 1942, No. 1812) which becomes effective on September 28, licences will be required to export to all destinations a wide variety of goods, among which are cotter, grooved, and taper pins manufactured wholly or mainly of iron and steel, metal filaments, and wire spirals, whether coiled or not, wholly or mainly of molybdenum or tungsten. The existing licensing requirements with respect to (*a*) casein and plastic materials derived therefrom; cellulose acetate and transparent synthetic resin; cellulose-acetate moulding powders and polymerised chlorovinyl compounds and (*b*) ball and roller bearings and parts thereof are superseded by the provision that licences will, in future, be required to export ball and roller bearings and parts thereof; and plummer blocks, brackets, hangers, and pedestals, incorporating such bearings.

Calder & Hebble Navigation.—The Minister of War Transport, on August 21, 1942, in pursuance of the powers conferred upon him by Section 45 of the Railway & Canal Traffic Act, 1888, made an Order releasing the Company of Proprietors of the Calder & Hebble Navigation from all liability to maintain the Halifax Branch Canal of 1¾ miles extending from its junction with the main Calder & Hebble Navigation at Salterhebble to the Halifax Basin in the County Borough of Halifax, and from

British and Irish Railway Stocks and Shares

Stocks	Highest 1941	Lowest 1941	Prices Sept. 11, 1942	Prices Rise/Fall
G.W.R.				
Cons. Ord. ...	43¾	30¾	47½	+ 1
5% Con. Pref. ...	109½	83½	107	—
5% Red. Pref. (1950)	105½	96½	105	—
4% Deb.	113½	102½	109	— ½
4½% Deb.	115	105½	110½	— 1
4½% Deb.	121½	112	115½	— 1
5% Deb.	132	122	127½	—
2½% Deb.	70	62¾	74½	—
5% Rt. Charge ...	129½	116	125½	—
5% Cons. Guar. ...	128	110½	123	—
L.M.S.R.				
Ord.	17¼	11	22	+ 1½
4% Pref. (1923) ...	53	33½	55½	+ 1½
4% Pref.	68½	48½	71½	— 1½
5% Red. Pref. (1955)	97¾	77	99½	—
4% Deb.	105¾	97	104	—
5% Red. Deb. (1952)	110½	106½	109½	—
4% Guar.	100	85¾	99	— ½
L.N.E.R.				
5% Pref. Ord. ...	3¾	2¾	5½	+ ¾
Def. Ord.	2	1½	2½	— ¼
4% First Pref. ...	52½	33	54½	+ 1½
4% Second Pref. ...	19¾	10	24½	— 1½
5% Red. Pref. (1955)	79½	52	87½	—
4% First Guar. ...	90½	74½	91½	—
4% Second Guar. ...	80½	59	82½	— ½
3% Deb.	79½	68¾	79	—
4% Deb.	104	91½	103	— ½
5% Red. Deb. (1947)	106	102½	104½	—
4½% Sinking Fund Red. Deb.	103½	99 11/16	103½	—
SOUTHERN				
Pref. Ord.	65½	43¾	68	— 1½
Def. Ord.	15¾	9	18	— 1
5% Pref.	107	77½	105½	—
5% Red. Pref. (1964)	107	89½	107½	—
5% Guar. Pref. ...	128	111	123	—
5% Red. Guar. Pref. (1957)	114½	107½	110¾	—
4% Deb.	112	102½	108	— 1
5% Deb.	130½	119	126½	—
4% Red. Deb. (1962–67)	108½	102	108½	—
4% Red. Deb. (1970–80)	108¾	102½	107½	—
FORTH BRIDGE				
4% Deb.	99½	90½	105	—
4% Guar.	99	85½	103½	—
L.P.T.B.				
4½% "A"	120 12/32	109½	115½	— 1
5% "A"	130½	115½	123½	—
4½% "T.F.A." ...	103½	99½	100	—
5% "B"	117	102	114½	—
"C"	46¾	28¾	48	— 1
MERSEY				
Ord.	24¾	19¼	23	— 1
4% Perp. Deb. ...	100	90	99	—
3% Perp. Deb. ...	73½	63	77	—
3% Perp. Pref. ...	58	51½	59	—
IRELAND				
BELFAST & C.D.				
Ord.	4	4	9	—
G. NORTHERN				
Ord.	14½	3	23½	— ½
G. SOUTHERN				
Ord.	14½	5	15	— ½
Pref.	17	10	20½	— ½
Guar.	44	16	43¾	+ 1½
Deb.	61	42	64	—

OFFICIAL NOTICES

OFFICIAL ADVERTISEMENTS

OFFICIAL ADVERTISEMENTS intended for insertion on this page should be sent in as early in the week as possible. The latest time for receiving official advertisements for this page for the current week's issue is 9.30 a.m. on the preceding Monday. All advertisements should be addressed to:—*The Railway Gazette*, 33, Tothill Street, Westminster, London, S.W.1.

London and North Eastern Railway

NOTICE is hereby given that, for the purpose of preparing the Warrants for Interest payable on the 15th October, 1942, on the Company's 5 per cent. Redeemable Debenture Stock, the balance will be struck as at the close of business on 28th September, and such Interest will be payable only to those Stockholders whose names are registered on that date.

Transfers of the 5 per cent. Redeemable Debenture Stock should, therefore, be lodged with the Registrar of the Company at Hamilton Buildings, Liverpool Street Station, London, E.C. 2, before 5.0 p.m. on 28th September.

By Order:
P. J. DOWSETT,
Secretary.

Marylebone Station,
London, N.W.1.
18th September, 1942.

Now on Sale

Universal Directory of Railway Officials and Railway Year Book

48th Annual Edition, 1942-43

This unique publication gives the names of all the principal railway officers throughout the world together with essential particulars of the systems with which they are connected. Much general and statistical information about railways is also concisely presented.

Price 20/- net.

THE DIRECTORY PUBLISHING CO., LTD.
33, Tothill Street, Westminster, S.W.1

all statutory and other obligations in respect thereof or of or consequent on the abandonment thereof.

Clayton Dewandre Co. Ltd.—Interim dividend on ordinary stock 4 per cent. (same).

Craven Bros. (Manchester) Ltd.—Interim dividend 5 per cent., against 4 per cent.

British Insulated Cables Limited—An interim dividend of 5 per cent., less tax, is announced, the same as a year ago.

Vasco - Asturiana Railway.—Gross earnings in 1941 were 11,836,832 pesetas and expenses 8,993,192 pesetas. Profits were 1,776,363 pesetas, and dividend 7 per cent.

Colvilles Limited.—Payment is announced of the dividend on the preference stock at the rate of 5¼ per cent. per annum, less tax, in respect of the six months ended September 30.

Cantabrian Railway.—The report for 1941 shows gross earnings of 7,739,300 pesetas and working expenses of 5,540,953 pesetas, and after meeting prior charges the net profit allows of payment of a dividend of 6 per cent.

Argentine Traffic Receipts.—With this issue the traffic returns for the British-owned Argentine railways, which appear weekly, on the next page, will be converted to Sterling at 16⅞ pesos to the pound.

Increased Traffic in Canada.—Mr. Alistair Fraser, Vice-President (Traffic), Canadian National Railways, stated recently that Canadian railway traffic had increased by about 30 per cent. over that of last year, and that his company was handling the heaviest in history.

Scrap Iron from Railways.—Mr. Donald Nelson, Chairman of the United States War Production Board, warned his country recently that even old bridges and railways would have to play their part in helping to meet the demand for scrap metal. Mr. R. W. Worlcott, President of the Lukens Steel Company, supported Mr. Nelson's appeal for a more intensive salvage campaign, and said that there was only two weeks' supply of steel scrap in the country in the hands of the steel mills.

Boiler Repair Costs.—According to the annual report of the Federal Co-ordinator of Transport, the estimated average cost of boiler maintenance and repairs in the U.S.A. is 30 per cent. of the cost of the total locomotive maintenance and repair charges. One large railway found that the proportion varied from 9 per cent. on the best water-treated division to 38 per cent. on the worst untreated division. With proper water treatment it is believed by some mechanical department officials that the proportion should not exceed 15 per cent., but only five lines out of 165 reporting to the Federal Co-ordinator attained this value.

Northern of Spain Railway Company.—The proceedings at the annual general meeting held in Madrid on May 19, when the report for 1941 was presented, were limited to the explanation by the Chairman that no payment had yet been made by the Government on account of the annuity, the amount of which had not yet been fixed.

Santander - Bilbao Railway.—Total earnings in 1941 reached the record figure of 13,912,631 pesetas, and net earnings were 3,521,953 pesetas or 4,102,869 pesetas with sundry receipts; this enabled a dividend of 5·5 per cent. to be paid. On the Santander-Bilbao line 3,959,102 passengers were carried, and 648,253 tons of goods, and on the Bilbao-Las Arenas-Plencia line, 7,471,476 passengers and 100,239 tons of goods.

L.N.E.R. Redeemable Debenture Stock.—For the purpose of preparing the warrants for interest payable on October 15, 1942, on the L.N.E.R. 5 per cent. redeemable debenture stock, the balance will be struck as at the close of business on September 28, and such interest will be payable only to those stockholders whose names are registered on that date. Transfers of the stock should, therefore, be lodged with the Registrar at Hamilton Buildings, Liverpool Street Station, E.C.2, before 5 p.m. on September 28.

Joint Working Rejected at Southend.—Southend Corporation has rejected an offer of joint working on local road transport services made by the Westcliff-on-Sea Motor Services Limited (a subsidiary of Thomas Tilling Limited). The company had suggested that all local receipts and mileage should be pooled and apportioned between the two undertakings on the basis of 1941 figures, and the arrangement was advanced with a view to eliminating overlapping and unnecessary working. Southend Corporation has intimated that it does not wish to enter into a permanent arrangement based on a period when bus traffic conditions were far from normal.

Bus Board Proposed in Monmouthshire.—The Bedwas & Machen Urban District Council, which has operated motor-bus services since January, 1922, has adopted a proposal that a statutory bus board be formed of the Bedwas & Machen, Caerphilly, and Gelligaer urban district councils to take over the transport undertakings of the three councils. A joint committee representing the three authorities has been formed for preparing a Bill to be submitted to Parliament. The Caerphilly municipal bus services date from April, 1920, and those of Gelligaer U.D.C. from 1928. Caerphilly operates certain services in conjunction with Cardiff Corporation, Pontypridd U.D.C., and the West Monmouthshire Omnibus Board.

Smoking at Mersey Docks.—The Ministry of War Transport has approved a by-law recently submitted by the Mersey Docks & Harbour Board in substitution of By-law No. 6 of 1923 which prohibited smoking "within any transit shed or warehouse, or within the limits of any dock, pier, or other works of the board, or on board of any vessels in any dock." The new by-law which came into force on September 14 permits smoking in various places unless a contrary notice is exhibited, or unless certain goods are in the vicinity. The places include residences, offices, canteens and refreshment rooms, certain lavatories, slaughter-houses of the Mersey Cattle Wharf, roadways and open quays free of certain bulk cargo, and in the cabins or living rooms of a vessel if not carrying petrol, etc., and free from vapour.

Contracts and Tenders

The Egyptian State Railways have recently placed the following orders:—

Willam Tessel & Sons: Steam gland packing.
Richard Klinger Limited: Joints.
Tuck & Co. Ltd.: Joints.
Bells Asbestos & Engineering Limited: Cut joints.
Alley & Maclellan Limited: Pneumatic spares.
Morrison, Marshall & Hill: Ropes.
The Morgan Crucible Co. Ltd.: Carbon brushes.
P. & W. Maclellan Limited: Steel angles and channels.
Power Flexible Tubing Co. Ltd.: Flexible tubing.
Imperial Chemical Industries Limited: Copper tubes.
Denton & Best: Cast steel.
Edison Swan Electric Co. Ltd.: Lamps.
The General Electric Co. Ltd.: Cable.
British Iron & Steel Corporation: Plates.
Charles Richards & Sons Limited: Bolts and nuts.
Siemens Brothers & Co. Ltd.: Porus pots.
Jones & Colver Limited: Best quality cast steel.
Buck & Hickman Limited: Grinding stones.
Durex Abrasives Limited: Garnet finishing paper.
Metropolitan-Vickers Electrical Co. Ltd.: Contacts.
Thos. Hinshelwood & Co. Ltd.: Pale green paint.
Docker Brothers: Varnish.
Associated Lead Manufacturers Limited: Black paint.
Watliffe Co. Ltd.: Commutator.
Sentinel Waggon Works (1936) Limited, The Vacuum Brake Co. Ltd., Holden & Brooke Limited, Richard Klinger Limited, and Davies & Metcalfe Limited: Spares for steam railcars.

Railway Stock Market

After last week's widespread improvement in Stock Exchange markets, the general tendency of security values has become slightly reactionary in the absence of further improvement in demand. At the time of writing, however, the higher prices made recently have induced very little profit-taking, and due to the firmness with which they are held, many securities have remained in small supply in the market. Home railway stocks have not maintained recent gains in full, but, nevertheless, in many instances they have recorded good improvement on balance. This applies more particularly to the junior stocks, but satisfactory gains have also been shown in preference issues, such as L.M.S.R. senior preference and L.N.E.R. first preference, which must be considered as giving generous yields when considered in relation to their good investment merits. By reason of the wartime financial agreement their dividends can, in effect, be considered as virtually guaranteed by the Government. A somewhat similar position exists as to the more junior stocks; the assumption is that dividend rates on the latter should at least be maintained unless future war damage were on an exceptionally heavy scale. The disposition in some quarters is to take the view that a slightly less conservative dividend policy may be followed in future; but it is perhaps unlikely that any increases would be decided unless there were general confidence that the higher payments could be maintained throughout the period of the war. In any case, with the exception of Great Western ordinary, which earned 5 per cent., or 1 per cent. more than the payment made last year, any increases could not be more than fractional in character. Recent buying, however, has not been based on attention drawn to instances where earnings last year were slightly above the dividends paid, but on the wider recognition that yields on junior stocks of the main-line railways are well in excess of those on leading equity securities in other sections of the Stock Exchange.

Compared with a week ago, Great Western ordinary has risen on balance from 46⅝ to 47¼, and the 5 per cent. preference was 107, the guaranteed stock 123, and the 4 per cent. debentures 109. L.M.S.R. ordinary, which has remained in favour at the time of writing, has moved up from 21 to 22⅛; the investment merits of the senior preference stock received more attention, and improved demand resulted in advancing the price to 72, which compares with 70½ a week ago. Moreover, L.M.S.R. 1923 preference has risen on balance from 54½ to 56; the guaranteed stock was slightly higher at 99, and the 4 per cent. debentures were 104. Among L.N.E.R. issues, the first preference has gained 1½ points to 55, and the second preference at 24½ has risen a further point as compared with a week ago. On the other hand, L.N.E.R. guaranteed issues were little changed, the first guaranteed at 91½ was, in fact, unchanged on balance, and the second guaranteed at 82½ showed only a small gain. L.N.E.R. deferred and preferred were less active, and were 2⅞ and 5 respectively. Southern deferred has not held best prices touched recently, but at 18 was fractionally higher on the week; the preferred further improved from 66½ to 67⅜; buyers of the latter were attracted by yield and investment considerations. Southern 4 per cent. debentures were 108, the guaranteed stock 123, and the 5 per cent. preference 105. At 48¼, London Transport "C" was unchanged on balance, and the prior charge stocks held recent gains.

Only very small movements have been recorded in Argentine railway stocks; the disposition is to await the results for the past financial year. In the absence of demand, moderately lower prices ruled for various debenture and preference stocks. Elsewhere, San Paulo ordinary and United of Havana debentures were lower. Canadian Pacifics rallied on the official statement as to the position as to E.P.T. French railway sterling bonds were again better.

Traffic Table and Stock Prices of Overseas and Foreign Railways

	Railways	Miles open 1941–42	Week Ending	Traffic for Week: Total this year	Traffic for Week: Inc. or Dec. compared with 1941	No. of Weeks	Aggregate Traffics to date: Totals: This Year	Aggregate Traffics to date: Totals: Last Year	Aggregate Traffics to date: Increase or Decrease	Shares or Stock	Prices: Highest 1941	Prices: Lowest 1941	Prices: Sept. 4, 1942	Prices: Yield‡ (See Note)
				£	£		£	£	£					
South & Central America	Antofagasta (Chili) & Bolivia	834	6.9.42	13,730 –	7,530	36	754,020	667,630 +	86,390	Ord. Stk.	10⅜	3⅛	11	Nil
	Argentine North Eastern ...	753	5.9.42	11,610 –	1,518	10	129,312	119,388 +	9,924	,,	4	1	5	Nil
	Bolivar	174	Aug., 1942	3,790 –	60	—	35,191	30,717 +	4,474	6 p.c. Deb.	5	5	12½	Nil
	Brazil	—	—	— —	—	—	—	— —	—	Bonds	8	2½	16	Nil
	Buenos Ayres & Pacific ...	2,807	5.9.42	86,940 +	14,640	10	809,280	788,160 +	21,120	Ord. Stk.	7¾	1½	5	Nil
	Buenos Ayres Great Southern	5,080	5.9.42	125,100 –	6,180	10	1,201,200	1,205,040 –	3,840	Ord. Stk.	10¾	3½	8½	Nil
	Buenos Ayres Western ...	1,930	5.9.42	54,720 +	7,980	10	469,800	448,740 +	21,060	,,	9	2½	7½	Nil
	Central Argentine	3,700	5.9.42	123,660 —	—	10	1,178,892	1,044,924 +	133,968	,,	8¼	2½	6½	Nil
	Do.	—	—	— —	—	—	—	— —	—	Dfd.	9½	½	3½	Nil
	Cent. Uruguay of M. Video...	972	5.9.42	19,783 –	824	10	193,800	209,666 –	15,866	Ord. Stk.	9½	1	5½	Nil
	Costa Rica	262	July, 1942	12,761 –	11,815	52	12,761	24,576 –	11,815	Stk.	15½	11½	13½	Nil
	Dorada	70	June, 1942	17,669 +	4,469	25	81,215	75,300 +	5,915	1 Mt. Db.	97	97	88½	6½
	Entre Rios	808	5.9.42	17,112 –	2,748	10	165,390	179,586 –	14,196	Ord. Stk.	6½	½	5½	Nil
	Great Western of Brazil ...	1,030	5.9.42	10,400 –	2,100	10	354,400	319,100 +	35,300	Ord. Sh.	11/-	1/-	1/3	Nil
	International of Cl. Amer. ...	794	June, 1942	$115,937 –	$5,230	25	$844,687	$673,300 –	$171,387	—	—	—	—	—
	Interoceanic of Mexico ...	—	—	— —	—	—	—	— —	—	1st Pref.	⅜	6d.	⅜	Nil
	La Guaira & Caracas... ...	22½	Aug., 1942	9,825 +	1,245	33	54,765	51,825 +	2,940	—	—	—	—	—
	Leopoldina	1,918	15.8.42	31,697 –	1,275	33	976,199	814,164 +	162,035	Ord. Stk.	4	¼	4¼	Nil
	Mexican	483	31.8.42	ps. 429,700 –	ps. 74,600	10	ps. 2,677,100	ps. 2,740.100 – ps.	63,000	,,	⅜	¼	¼	Nil
	Midland of Uruguay	319	July, 1942	11,961 –	2,549	4	11,961	14,510 –	2,549	—	—	—	—	—
	Nitrate	382	31.8.42	9,577 –	4,812	9	125,118	91,721 +	33,397	Ord. Sh.	66⅜	1½	3⅞	3⅞
	Paraguay Central	274	4.9.42	$4,088,000 +	$876,000	10	$36,458,000	$34,710,000 +	$1,748,000	Pr. Li. Stk.	43/-	29	47½	12½
	Peruvian Corporation ...	1,059	Aug., 1942	85,805 +	14,147	9	165,606	137,208 +	28,398	Pref.	6½	1⅛	14¼	Nil
	Salvador	100	June, 1942	c 46,000 –	c 10,000	50	c 1,005,172	c 799,683 +	c 205,489	—	—	—	—	—
	San Paulo	153½	30.8.42	36,998 –	964	35	1,267,010	1,230,249 –	37,761	Ord. Stk.	52	24¼	54	3½
	Taltal	160	Aug., 1942	5,235 –	750	8	11,725	9,165 +	2,560	Ord. Sh.	1	6/-	1⅛	Nil
	United of Havana	1,346	5.9.42	32,416 +	9,599	10	381,182	192,576 +	188,606	Ord. Stk.	2½	½	4¼	Nil
	Uruguay Northern... ...	73	July, 1942	1,137 –	220	4	1,137	1,357 –	220	—	—	—	—	—
Canada	Canadian National	23,562	7.9.42	1,461,400 +	298,000	36	48,854,800	39,805,200 +	9,049,600	—	—	—	—	—
	Canadian Pacific	17,049	7.9.42	891,000 +	37,800	36	33,893,600	28,691,000 +	5,202,600	Ord. Stk.	13⅞	7⅛	10½	Nil
India†	Barsi Light	202	July, 1942	23,685 +	8,903	17	63,285	67,635 –	4,350	—	—	—	—	—
	Bengal & North Western ...	2,090	July, 1942	261,600 –	5,267	18	1,080,300	1,092,128 –	11,828	Ord. Stk.	345	253	349½	5⅛
	Bengal-Nagpur	3,267	20.6.42	284,100 +	31,301	11	2,271,525	2,107,876 +	163,649	,,	101	95¾	94	4¼
	Madras & Southern Mahratta	2,939	30.6.42	212,550 +	3,338	13	1,945,373	1,858,969 +	86,404	,,	105⅞	101¼	99	7⅛
	Rohilkund & Kumaon ...	571	July, 1942	58,275 –	3,099	18	234,300	272,651 –	38,351	,,	342	290	351½	4⅝
	South Indian	2,402	20.6.42	179,171 +	43,616	12	1,376,295	1,113,057 +	263,238	,,	100	87	94	3½
Various	Beira	204	June, 1942	71,394 —	—	38	672,109	— —	—	—	—	—	—	—
	Egyptian Delta	607	10.7.42	9,878 +	2,295	15	105,867	67,066 +	38,801	Prf. Sh.	1½	29/-	2½	Nil
	Manila	—	—	— —	—	—	—	— —	—	B. Deb.	68	45	37½	9⅓
	Midland of W. Australia ...	277	July, 1942	27,869 +	9,221	52	27,869	18,648 +	9,221	Inc. Deb.	90½	86½	89½	6
	Nigerian	1,900	27.6.42	61,623 +	16,678	13	693,193	697,968 –	4,775	—	—	—	—	—
	Rhodesia	2,442	June, 1942	488,130 —	—	13	4,306,101	— —	—	—	—	—	—	—
	South Africa	13,291	4.7.42	793,090 +	20,324	15	10,428,739	9,945,447 +	483,262	—	—	—	—	—
	Victoria	4,774	Mar., 1942	1,339,304 +	366,183	37	10,425,476	8,391,343 +	2,034,133	—	—	—	—	—

Note. Yields are based on the approximate current prices and are within a fraction of ¼ Argentine traffics are given in sterling and are calculated at 16⅔ pesos to the £. † Receipts are calculated @ 1s. 6d. to the rupee § ex dividend